ALASKA PENINSULA AND ALEUTIAN ISLANDS MANAGEMENT AREAS SAC ROE HERRING REPORT AND THE ALEUTIAN ISLANDS MANAGEMENT AREA FOOD AND BAIT HERRING REPORT, 1998

By

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Regional Information Report[1] No. 4K99-23

Alaska Department of Fish and Game
Division of Commercial Fisheries
211 Mission Road
Kodiak, Alaska 99615

March 1999

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ACKNOWLEDGMENTS

Seasonal employee Briana Lawson helped with data processing and scale sampling of Alaska Peninsula herring and Tim Clark processed the catch samples from the Aleutian Islands fishery. Joan Brodie aged all Alaska Peninsula and Aleutian Islands herring samples and produced age, weight, length, and sex summary files. Scott Moyer and Randy Weber, ADF&G pilots, provided most of the aircraft support. Several fishers provided Aleutian Islands catch samples. Aleutian Islands ADF&G staff Robert Gish, George Pappas, Rance Morrison, Ken Bouwens, Dan Connolly, and Ted Spencer aided with management of the food and bait commercial herring harvest and acquired the catch samples. Kathleen Herring and Sue Engle provided office assistance in Dutch Harbor. Wayne Donaldson assisted with management of the Aleutian Islands fishery. Thanks are also extended to Lucinda Neel for her publication expertise.

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ABSTRACT

The 1998 commercial sac roe herring fishery season extended from April 15 through July 15 in the South Alaska Peninsula, from April 15 through June 30 in the Amak District of the North Peninsula, and from April 15 through June 15 in Aleutian Islands waters. In the Port Moller and Port Heiden Districts of the North Peninsula, herring may be taken only during fishing periods established by emergency order from April 15 through June 30. During 1998, there were three fishing periods in the Port Moller, but due to confidentiality requirements the amount of harvest cannot be released. No landings were reported in the South Alaska Peninsula or Aleutian Islands areas in 1998 due to low observed herring biomass and poor market conditions.

Aerial biomass survey estimates were documented for the North Peninsula: Herendeen Bay (930 tons), Moller Bay (135 tons), and Bering Sea Coast (360 tons). There were a limited number of surveys in 1998 due to poor weather conditions and the lack of industry conducted surveys.

In 1998, commercial food and bait catches occurred in the Aleutian Islands Management Area. The Aleutian Islands Management Area "Dutch Harbor" food and bait herring fishery had one opening on July 16. The Aleutian Islands "Dutch Harbor" food and bait herring harvest was 1,993 tons (bait only), with an allocation of 1,590 tons, and a test fishery harvest of 59.9 tons. The price per ton was $300, giving a food and bait exvessel value of approximately $598,000 for the Aleutian Islands Management Area commercial food and bait herring fishery. During the fishery, 24 purse seine permit holders made 22 deliveries to three companies that purchased herring.

KEY WORDS: Alaska Peninsula, Aleutian Islands, herring, catch, age, length, weight, sex, sac roe, food

INTRODUCTION

The objectives of this report are: (1) to present historical information on the fishery, (2) to present the biomass harvested in the commercial catch for each statistical day in the Alaska Peninsula and Aleutian Islands Management Areas during 1998; (3) to estimate the age and sex composition of harvests; (4) to estimate the mean length and weight of herring harvested in commercial fisheries; and (5) to estimate the biomass of herring within each area. This information helps the department evaluate harvest rates, recruitment events, and to refine management of these fisheries. This report is intended as a reference document; interpretation and discussion of the data are therefore limited.

Alaska Peninsula

The Alaska Peninsula and Aleutian Islands Management Areas (Figures 1-2) are described as Management Area "M" and are divided into three subareas; (1) the North Peninsula, consisting of Bering Sea waters extending west from Cape Menshikof to Cape Sarichef; (2) the South Peninsula, consisting of Pacific Ocean coastal waters extending west of Kupreanof Point to 163°30' W. long. (the south side of Unimak Island near Cape Lazaref); and (3) the Aleutian Islands, consisting of Bering Sea waters extending west of Unimak Pass and Pacific Ocean waters extending west from 163°30' W. long. (the south side of Unimak Island near Cape Lazaref) to the International Date Line (Figures 3-8).

The North Peninsula is comprised of three districts and 23 statistical areas, the South Peninsula includes three districts and 45 statistical areas, and the Aleutian Islands includes five districts and 41 statistical areas. Fishing normally begins in late May in both North and South Peninsula waters and ends in mid to late June. The Aleutian Islands has not had a sac roe herring harvest since at least 1979. The fishery for food and bait herring in the Aleutian Islands Management Area begins by regulation on July 15.

Commercial herring fisheries are regulated by emergency order to achieve exploitation mandates by the Alaska Board of Fisheries (BOF) and to address problems with wastage. Management plans and other BOF directives set policies by which these fisheries are prosecuted (ADF&G 1997; Witteveen et al. 1998; Witteveen and Campbell 1998).

Herring have been reported throughout the North and South Peninsula, and in Unalaska and Adak Island waters of the Aleutian Islands Management Area. Major concentrations of herring and fishing effort have occurred in North Peninsula waters in Port Heiden, Port Moller, and Herendeen Bays, and along the Bering Sea coast in near shore waters from Entrance Point to Cape Seniavin. Known herring stocks and most fishing effort occurs in South Peninsula waters in the Shumagin Islands, and Stepovak, Pavlof, and Canoe Bays. Fishing for sac roe herring has also occurred between Dolgoi Island and Lenard Harbor, but tended to be timed later than areas to the east. Fishing effort in the Aleutian Islands Management Area has been limited to Unalaska and Akutan Islands waters.

From 1981 through 1995, the Alaska Department of Fish and Game (ADF&G) deployed field crews in the Alaska Peninsula for the purpose of collecting data and to monitor the fishery. Crews collected herring samples and documented spawning areas and substrate. Department personnel have conducted aerial surveys in the Alaska Peninsula since 1981, but with limited success, primarily due to the large area involved, poor weather conditions, budget constraints, turbidity of the water, and the sporadic and unpredictable arrival of the herring. Because of these limitations, the management staff believes only the surveys flown in 1989, 1991, and 1992 provide an accurate assessment of the total spawning biomass only in North Peninsula waters.

Aerial surveys of the Port Moller area by department personnel in 1976 reported numerous schools of herring in Herendeen Bay (Warner and Shafford 1979). The first commercial catches of sac roe herring in North Peninsula waters occurred in 1982 when 505.5 tons were harvested. An additional 138.3 tons of herring were harvested in South Peninsula waters in 1982 for a total Alaska Peninsula harvest of 643.8 tons (Table 1). From 1989-98, the harvests ranged from 0 to 3,969 tons and averaged 741.1 tons during the North Peninsula sac roe herring fishery. Since 1982, the majority of the catch was taken from Herendeen and Moller bays except in 1986, 1989, and 1998 when most of the catch was taken on the Bering Sea coast between Entrance Point and Cape Seniavin (Table 2). In 1992, over 40% of the North Peninsula harvest came from Port Heiden Bay.

Prior to 1982, fishing vessels destined for or returning from the Togiak herring fishery frequently looked for herring in the Port Moller and Port Heiden Districts, but no harvest occurred. During the 1986-88 seasons, an average of 52 vessels were present in the Port Moller District, but only a few permit holders actually harvested herring. Starting in 1986, fishing effort increased on the earlier arriving biomass. From 1989 through 1992, the department used its emergency order authority to delay opening the Port Moller District until May 30 in an attempt to shift fishing pressure from the earlier arriving herring to the later more abundant fish. However, the Port Moller District could open prior to May 30 by subsequent emergency order(s) if ADF&G personnel documented enough herring in the area to justify a fishery. The later opening date started a trend of decreasing effort, and fishers returning from Togiak tended to pursue halibut or salmon fisheries rather than wait for the Port Moller herring fishery to open. The Port Moller District opened prior to May 30 from 1991 through 1995 and again in 1998 because the herring biomass was sufficient to warrant commercial harvests. The run timing of the North Peninsula stocks appears to be two to three days after the biomass peaks in the Togiak fishery. Since 1993, the Togiak sac roe herring harvest strategy has extended the harvest well after the peak biomass. This change in harvest strategy, along with lower biomass levels, has probably caused lower than expected harvests in the North Peninsula since the industry now arrives well past the expected North Peninsula peak biomass.

The South Peninsula sac roe herring harvest and effort continues to fluctuate since it began in 1979. During years in which commercial sac roe herring harvests occurred, landings have been reported from 18 geographical locations; of these, only Canoe Bay produced a consistent annual harvest (Table 3; Figure 8).

In South Peninsula waters, significant landings occurred in 1980 (453.8 tons), and peaked in 1981 (797.4 tons; Table 1). The BOF closed the South Peninsula sac roe herring fishery in 1983, allocating all catches to a food and bait herring fishery that failed to develop. From 1984 through 1991, the BOF allocated the catch between the sac roe fishery (75% of the allowable harvest) and the food and bait fishery (25% of the allowable harvest). In 1992, the BOF allocated the entire harvest to the sac roe herring fishery (Witteveen et al. 1998).

Since 1981, the effort levels and harvests have generally decreased in South Peninsula waters. Most bays have small harvestable quantities of herring but the cost of keeping fishing vessels, tenders, and airplanes on call to harvest each section's quota (Table 4) makes fishing North Peninsula herring more attractive. Since much of the South Peninsula herring appear to spawn later than North Peninsula herring, many salmon fishers do not participate in the South Peninsula herring fishery.

Aleutian Islands

The Aleutian Islands Management Area food and bait herring season is established by regulation and extends from July 15 through February 28. Actual fishing time of the fishery is based on inseason evaluation of the observed biomass and harvest (Tables 5 and 6). Although the entire Aleutian Islands Management Area may open by regulation, openings have been limited to the vicinity of Unalaska and Akutan Islands due to processing capabilities and herring concentrations. The Unimak, Akutan, and Unalaska Districts and that portion of the Umnak District located east of Samalga Pass are commonly referred to as the "Dutch Harbor" food and bait herring fishery (Figures 2-4). Two management plans: (1) the Bering Sea Herring Fishery Management Plan (Appendix B; 5 AAC 27.060), and (2) Aleutian Islands Management Area food and bait herring management plan, (Witteveen and Campbell 1998) are used to manage the fishery.

Historically, the "Dutch Harbor" food and bait fishery occurred from 1929 through 1938 and in 1945 (Table 5). This fishery was a mixture of gillnet and purse seine catches, holding pounds, and numerous small, shorebased hand packing operations. A large portion of the catch was brined for either food or bait purposes while some product was frozen. Purse seine gear provided the bulk of the harvest.

From 1981–86 and 1990–98 harvests in the "Dutch Harbor" food and bait herring were achieved with purse seine gear (Table 6). During the 1987-88 herring seasons, one gillnet permit holder participated while in 1989 two gillnetters made landings. Currently, purse seine vessels average approximately 50 feet in keel length and deploy seines up to 250 fathoms in length and 25 to 35 fathoms in depth.

Prior to 1992 and during 1994-96, fishing occurred at night using sonar. In the past when herring left traditional fishing areas, fishers conducted organized "sonar searches" over fairly large areas until concentrations of herring were located. Between 1992-94, 1997, and 1998, the fishery occurred during daylight hours using aircraft to locate herring. During the past four seasons, the number of aircraft used to locate concentrations of herring increased from three in 1995 to a high of nine in 1997 and seven in 1998. When catcher vessels leave the immediate area of shorebased processing facilities, industry follows with floating processors and tenders. Processing efficiency and product quality may decline when this occurs. Harvest locations have extended over approximately 90 miles, from Tigalda Island to Makushin Bay on Unalaska Island. However, in recent years, the majority of the harvest occurred within a five mile radius of shorebased processing facilities in Unalaska and Akutan Bays.

Historically, quality concerns associated with feeding herring (i.e. "belly burn") have occurred in the food and bait fishery. Feed problems were overcome in the past by using holding pounds, where seine caught herring were held until their stomachs became empty. Gillnet caught herring

required special handling to prevent spoilage. Most feed related problems have been eliminated in the current fishery by using ice and chilled seawater in conjunction with rapid processing.

The timing and availability of herring in the Dutch Harbor area has changed in recent years. Aleutian Islands herring were previously categorized into an early summer run (late June to late July) and a late summer run (late August to early September). However, this run timing pattern does not seem to apply to the current (post 1980) fishery. Herring now arrive in the Dutch Harbor area about July 1 and are available through mid-September.

Shorebased processors purchase the majority of the herring harvested. Floating processors have been used most years; however, they are limited by daily handling capacities.

Generally, the exvessel value for bait herring has exceeded that for food herring, although during the past few seasons the same price has been paid for both food and bait herring. While Aleutian food herring are a desirable product, a more reliable supply of food herring from other countries currently dominates the market. Food herring must be processed rapidly and when the allocation is harvested quickly (less than a day) processors can only produce a limited amount of food herring before the flesh is no longer fit for human consumption. Bait herring is used locally and statewide for the longline and pot fisheries. The demand for quality bait has increased in recent years and a premium price is paid for fresh herring with high oil content. Overall, the market for bait herring has remained more stable than the food herring market.

The harvest strategy for the "Dutch Harbor" food and bait herring fishery has changed since it was re-established in 1981. During the 1981 and 1982 seasons, there were no harvest restrictions. From 1983 to 1985, the BOF implemented a harvest ceiling of 3,527 tons per year due to biological concern over multiple exploitation of Eastern Bering Sea spawning stocks, specifically the Bristol Bay, Nelson Island, and Port Moller stocks. Scale pattern analysis studies identified some herring harvested during the Aleutian Islands food and bait herring fishery to be part of the Eastern Bering Sea herring biomass (Rogers and Schnepf 1985). Because extensive sac roe fisheries already occur on these Eastern Bering Sea herring stocks in their spawning areas, the department wants to avoid over exploitation above the BOF's guideline harvest level policy. In 1986, ADF&G modified the harvest ceiling in response to the BOF concern for the possible lack of recruitment in the contributing stocks (primarily Togiak, to which the bulk of the Aleutian catch is estimated to be comprised). In 1986, the BOF reduced the Aleutians harvest allocation by 30% to 2,453 tons. This reduction corresponded with the percent reduction of the observed Togiak herring spawning biomass between the springs of 1985 and 1986. The 1987 herring harvest allocation was 2,332 tons, which was proportional to the 1985 to 1987 reduction of the observed Togiak spawning biomass.

In 1988, the BOF implemented the Bering Sea Herring Fisheries Management Plan, which established the biological criteria for calculating the "Dutch Harbor" food and bait quota (Appendix B: 5 AAC 27.060). To insure conservation of herring stocks, the BOF adopted a requirement that the overall exploitation of a herring stock should not exceed 20% of the spawning biomass. In the case of the Togiak spawning stock, an allocation between the sac roe fishery, spawn on kelp fishery, and the "Dutch Harbor" food and bait fishery was established to prevent the catch from exceeding 20% of the observed spawning biomass. The BOF also considered the number of fishers involved and the value of the fishery when they established the allocations.

In 1991, the BOF changed the "Dutch Harbor" food and bait herring fishery opening date from August 15 to 12:01 a.m. July 16 to reduce the chance of catching non Togiak and North Alaska Peninsula herring stocks in the "Dutch Harbor" fishery. From 1992-94, ADF&G conducted the majority of fishing periods during daylight hours. The change from night to daylight openings was intended to improve the department's ability to monitor and manage the fishery. Prior to 1992, fishers located and set on herring schools at night using sonar. Although sonar is still used to locate schools, spotter pilots and fishers also searched for feeding sea birds and sea mammals that directed them to herring schools. In 1995-96, the fishery was conducted at night in an attempt to slow down the rate of harvest. In 1998, the BOF changed the opening date again to 12:00 noon on July 15 due to safety concerns with the fishery being conducted in the dark.

METHODS

Division of Commercial Fisheries personnel compiled the commercial catch data, which were based on computer tabulations originating from individual sale receipts (fish tickets) given to fishers at the time of delivery. Fish tickets and the computer generated summaries were edited by ADF&G staff for errors and omissions. Because extensive fish ticket editing is usually required to finalize the data for any given year, later reports may contain minor differences in the catch information listed in this report.

Catch Sampling

Age compositions were computed for the catch sampled in the "Dutch Harbor" food and bait fishery (Table 10 and 11) and the North Peninsula sac roe fishery harvest (Table 12). Age was determined by examining scales (Warner and Shafford 1979) taken from the preferred area located on the left side of the herring three scales posterior to the center of the operculum plate. One scale was taken from each herring, and the ages were recorded in actual fish age in years. The accuracy of age determination was not tested.

Standard length measurements were taken from the anterior most portion of the fish, including the lower jaw with the mouth closed, to the end of the vertebra (hypural plate) using a meter stick with 1 mm gradations. Accuracy of a length measurement was within ± 5 mm. Mean lengths were calculated from an unweighted composite of the data collected from each area sampled (Table 10; Table 12).

Weight measurements of fish were taken using a digital scale with 2.0 g gradations and reading the scale device to within 2.0 g. Accuracy of a weight measurement was within ± 2.0 g. Mean weights were calculated from an unweighted composite of the data collected from each area sampled (Table 10; Table 12).

Guideline Harvest Levels

The department established Guideline Harvest Levels (GHL's) preseason for Alaska Peninsula fisheries based on past fishery performance, age class data, and biomass estimates from ADF&G and industry aerial surveys (Table 4). Areas with little or no data on stock biomass were open for exploratory fishing. The GHL for the "Dutch Harbor" food and bait fishery was established by using the Bering Sea Herring Management Plan allocation formula (Appendix C).

SAC ROE FISHERY

In 1998, three fishery openings were conducted, but fishery harvest information cannot be released due to confidentiality requirements. The average harvest from 1989-98 was 741.1 tons (Table 7). The first herring in the Port Moller District were observed on May 12 (80 tons). The department did not allow any commercial fishing periods in the Port Moller District prior to May 20 when ADF&G anticipated the 1,000 ton threshold, established in the Bering Sea Herring Management Plan, would be achieved (ADF&G 1997). The entirety of the harvest occurred on May 27-28 while the first opening on May 20 and the last opening on June 2-3 resulted in no harvest due to fish quality. The entire harvest was exported to be processed in the Bristol Bay area.

In areas with a GHL, inseason fishing time is normally based on department biomass surveys and fishery performance. In areas open for exploration, (Aleutian Islands Management Area, Amak District, the Western Section of the Port Moller District, the Seal Cape-Wosnesenski Section of the Pavlof District and General Sections of the King Cove and Sand Point Districts), liberal fishing time was allowed to give fishers the opportunity to locate and harvest unknown herring stocks. All exploratory areas in the North and South Peninsula were unproductive (Table 2 and 3). Small harvests normally occur in Stepovak, Balboa, and Canoe Bays, Dolgoi Harbor, Lenard Harbor and the General Section (Shumagin Islands) of the South Peninsula. However, there was no reported herring fishing effort outside the Port Moller District in 1998 because of poor market conditions.

North Peninsula

There are three commercial herring fishing districts in North Peninsula waters: Port Heiden, Port Moller, and Amak Districts. Purse seine and gillnet gear are permitted in North Peninsula waters and both gear types share common time and area openings.

The entire 1998 North Peninsula GHL of 150 tons was allocated to the Port Moller District (Table 4). The Amak District was open for exploration continuously from April 15 through June 30. All North Peninsula waters closed to herring fishing on June 30. The department normally provides a minimum of six hours advanced notice prior to commercial fishing periods in the Port Moller and Port Heiden Districts.

Department staff arrived in the Port Moller area on May 6. The first aerial survey was conducted on May 11, but no fish were observed. The first school of herring was observed on May 12 and was estimated to be 80 tons. Aerial surveys continued through June 3 (Tables 8 and 9).

In 1998, the total observed biomass for the North Peninsula was 1,425 tons: Herendeen Bay (930 tons), Moller Bay (135 tons), and Bear River to Strogonof Point (360 tons) (Table 8). Spawning was documented in 1998 in Herendeen and Moller Bays. Aerial surveys were limited in 1998 due to weather conditions and the absence of industry conducted surveys. Industry surveys often direct ADF&G staff to herring concentrations so official department surveys can be conducted.

Historically, from mid-May through early-June, department and industry spotter pilots have reported capelin in North Peninsula waters. Capelin stocks were observed in 1998, but no biomass estimates are available.

1999 Outlook

The 1999 North Peninsula sac roe herring forecasted GHL is 150 tons. This forecast was calculated by applying a sliding scale exploitation rate to the 1999 biomass estimate (Appendix D). Historically, the North Peninsula herring abundance has been unpredictable and the GHL will be adjusted inseason based on observed stock size (Appendix D). Confidence in the 1998 North Peninsula forecast is only fair.

South Peninsula

The 1998 projected GHL for South Peninsula herring fisheries was 60 tons (Table 4). The Swedania Point-Balboa Bay, Point Aliaksin-Beaver Bay, and General Sections of the Sand Point District, the Pavlof Bay, Seal Cape-Wosnesenski and General Sections of the Pavlof District, and the King Cove District were open for exploratory fishing.

South Peninsula sac roe herring fisheries were open from April 15 through July 15. Fishing periods were established by emergency order to open at 12:00 noon on odd number days of the month and close at 12:00 noon on even number days of the month, followed by 24 hour closed periods.

The department conducted two aerial surveys of the South Peninsula in 1998, one on May 19 and June 16, but no herring biomass or spawn was observed. In 1998, no commercial herring harvest or fishing effort was reported in the South Peninsula due to the absence of any observed biomass and lack of industry interest in purchasing herring.

The historical age composition of South Peninsula commercial purse seine sac roe herring harvests by area and percent are presented in Appendix F.

1999 Outlook

The 1999 South Peninsula sac roe herring forecasted GHL is 40 tons and is based on the five year (1994-98) South Peninsula average harvest of 39.1 tons. Confidence in the 1999 South Peninsula forecast is only fair (Appendix D). Adjustments may be made inseason once herring biomass is quantified.

ALEUTIAN ISLANDS FOOD AND BAIT FISHERY

The 1998 "Dutch Harbor" commercial food and bait herring fishery was restricted to all waters of Unalaska Bay south of a line from Eider Point at 53°57.5' N. lat., 166°35.25'W. long. to Ulakta Head at 53°55.47' N. lat., 166°30.55' W. long. and south of the Dutch Harbor-Unalaska bridge in the Unalaska District (Figure 4). One fishing period occurred on July 16 from 9:30 p.m. to 10:00 p.m. (Appendix A). The fleet consisted of 24 purse seine vessels, 14 tenders representing three processing companies, and seven aircraft. The holding capacity for both tenders and purse seine vessels was an estimated 4,000 tons.

The 24 purse seine vessels made a total of 22 landings for a total harvest of 1,994 tons (Table 5). The actual harvest exceeded the GHL of 1,590 by 25.3 percent (403 tons) (Table 6). Processors purchased herring for $300 per short ton and the entire harvest was obtained for bait (Table 5). The exvessel value of the fishery was an estimated $598,000.

The department conducted a test fishery on July 13, 14 and 17 to obtain biological data, finance management of the fishery, and obtain information concerning location and volume of herring in the area. The department contracted a permit holder that conducted the test fishery. The test vessel did not locate substantial amounts of herring July 13th or 14th, but harvested 59.9 tons on July 17.

A total of 568 herring from the commercial fishery were analyzed for age, length, weight, and sex data. In the Unalaska District (Figures 2-4), the most abundant age classes in the commercial harvest were estimated as age-7 25.3%, age-8 26.0%, and age-10 14.6% (Table 11; Figure 9). The age composition is similar to past years (Table 11) with the exception of a relatively low percentage (8.4) of age-9 fish. The male to female ratio was 1.04 : 1.0. The average herring length in the sample was 274 mm, and the average weight was 316 g (Table 12).

1999 Outlook

The 1999 Dutch Harbor food and bait herring forecasted GHL is 1,155 tons (K. A. Rowell, ADF&G, Anchorage, memo, February 1999). This GHL was established by using the Bering Sea Herring Management Plan allocation formula given the 20% exploitation rate and the 1999 Togiak District forecasted biomass of 90,000 tons (Appendix C).

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Table 1. Alaska Peninsula Management Area commercial sac roe herring harvest by time period and area, 1979-98.

	North Peninsula		South Peninsula		
Year	Harvest (Tons)	Harvest Time Period	Harvest (Tons)	Harvest Time Period	Total
1979	0.0	-	10.1	July 4-July 4	10.1
1980	0.0	-	453.8	May 18-July 14	453.8
1981	0.0	-	797.4	May 9-June 23	797.4
1982	505.5	May 31-June 12	138.3	May 31-June 14	643.8
1983	627.0	May 9-May 29	0.0	-	627.0
1984	431.2	May 24-June 8	210.4	May 13-June 1	641.6
1985	710.2	May 24-June 4	287.8	June 1-June 11	998.0
1986	894.4	May 18-May 30	281.9	June 7-June 14	1,176.3
1987	513.7	May 9-June 5	319.0	June 8-June 19	832.7
1988	294.3	May 17-June 15	376.7	May 31-June 20	671.0
1989	729.0	May 28-June 23	310.3	May 13-June 19	1,039.3
1990	272.8	June 4-June 19	312.2	May 14-June 14	585.0
1991	1,313.0	May 17-July 4	157.4	May 16-June 11	1,470.4
1992	3,969.0	May 23-June 17	180.3	June 4-June 7	4,149.3
1993	535.9	May 8-June 9	97.0	May 27-June 9	632.9
1994	89.8	May 21-June 7	8.2	June 2-June 3	98.0
1995	337.3	May 29-June 20	62.7	June 6-June 17	400.0
1996[a]	95.8	June 12-June 18	124.4	May 10-June 27	220.2
1997	0.0	-	0.0	-	0.0
1998	[b]	May 21-June 3	0.0	-	[b]
1989-98 Average	741.1		125.3		866.3

[a] In the South Peninsula 7 tons were included in the harvest figure, but were not sold due to low roe percentage.

[b] This information cannot be released due to confidentiality requirements.

Table 2. North Peninsula commercial sac roe herring harvest by section, 1982-98.

Year	Port Moller District				Port Heiden District	Total
	Deer Island Mud Bay Section	Herendeen Bay Section	Port Moller Bay Section	Bear River Bering Sea Coast	Port Heiden Bay Section	
1982	0.0	279.5	180.0	46.0	0.0	505.5
1983	0.0	509.3	36.5	81.3	0.0	627.0
1984	0.0	180.8	250.4	0.0	0.0	431.2
1985	0.0	173.3	255.5	281.4	0.0	710.2
1986	0.0	156.1	254.8	483.5	0.0	894.4
1987	0.0	156.6[a]	349.8	7.3	0.0	513.7
1988	0.0	8.2	286.1	0.0	0.0	294.3
1989	0.0	67.0	246.5	415.6	0.0	729.0
1990	0.0	155.8	117.1	0.0	0.0	272.8
1991	156.3	167.0	689.6	300.2	0.0	1,313.0
1992	18.3	0.0	2,350.7	0.0	1,600.0	3,969.0
1993	0.0	106.6	371.0	57.9	0.0	535.9
1994	7.2	0.0	82.6	0.0	0.0	89.8
1995	3.2	145.7	188.4	0.0	0.0	337.3
1996	0.0	73.8	22.0	0.0	0.0	95.8
1997	0.0	0.0	0.0	0.0	0.0	0.0
1998	0.0	0.0	[b]	[b]	0.0	[b]
1989-98 Average	18.5	71.6	409.5	81.5	160.0	741.1

[a] At least 11 tons were caught in the Deer Island-Mud Bay Section.

[b] This information cannot be released due to confidentiality requirements.

Table 3. South Peninsula commercial sac roe herring harvest by geographic area, 1980-98.

	Area									
Year	Stepovak Bay[a]	Balboa Bay	Pavlof Bay	Canoe Bay	Volcano-Dolgoi	Belkofski Bay	Lenard Harbor	Dolgoi Harbor	Shumagin Islands	Total
1980	195.0	132.0	114.0	12.0	0.0	0.0	0.0	0.0	0.0	453.0
1981	122.0	36.0	225.0	206.0	65.0	23.0	110.0	0.0	0.0	787.0
1982	0.0	5.0	0.0	171.2	0.0	0.0	0.0	0.0	0.0	176.2
1983[b]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1984	30.0	25.0	0.0	155.4	0.0	0.0	0.0	0.0	0.0	210.4
1985	11.0	0.0	95.0	239.0	0.0	0.0	0.0	0.0	0.0	345.0
1986[c]	0.0	0.0	61.0	140.5	13.0	8.0	59.0	0.0	0.0	281.5
1987[c]	0.0	0.0	92.0	118.0	0.0	38.0	59.0	12.0	0.0	319.0
1988[d]	0.3	11.0	69.0	236.5	17.0	12.0	31.0	0.0	0.0	376.8
1989	39.0	17.0	53.0	148.0	0.0	0.0	9.0	5.0	39.0	310.0
1990	71.7	20.8	0.0	120.4	0.0	3.2	5.9	0.0	90.4	312.2
1991	19.3	19.3	0.0	77.5	0.0	0.0	0.0	0.0	41.4	157.4
1992	0.0	0.0	0.0	180.4	0.0	0.0	0.0	0.0	0.0	180.4
1993	4.6	0.0	0.0	92.2	0.0	0.0	0.0	0.0	0.0	96.8
1994	0.0	0.0	0.0	8.2	0.0	0.0	0.0	0.0	0.0	8.2
1995	0.0	9.8	0.0	52.9	0.0	0.0	0.0	0.0	0.0	62.7
1996[e]	27.8	3.9	0.0	77.1	0.0	0.0	0.0	0.0	15.6	124.4
1997	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1998	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1989-98 Average	16.2	7.1	5.3	75.7	0.0	0.3	1.5	0.5	18.6	125.2

[a] The 1984-88 catches came from Ramsey Bay, the 1989 and 1993 catch came from Granville Bay.

[b] In 1983 the South Peninsula sac roe fishery was closed, all herring catches were allocated to a food and bait fishery that did not develop.

[c] Stepovak Bay (Kupreanof Point to Swedania Point) was closed during 1986-87 due to the herring biomass being below the threshold required for a commercial fishery.

[d] In Stepovak Bay seven tons of immature (green) herring were dumped on May 7, and an additional two tons were dumped on May 11.

[e] In Stepovak Bay seven tons of immature (green) herring were dumped on May 15.

Table 4. Alaska Peninsula and Aleutian Islands Management Areas sac roe herring guideline harvest levels, by management area, 1998[a].

Management Area	Sac Roe Guideline Harvest In Short Tons
North Peninsula	
Amak District	[b]
Port Moller District[c]	0-150
Western Section	[b]
Deer Island Section[d]	[c]
Herendeen Bay Section	[c]
Inner Port Moller Bay Section	[c]
Outer Port Moller Bay Section	[c]
Bear River Section[e]	[c]
Port Heiden District[f]	[b]
North Peninsula Total	0-150
South Peninsula	
Sand Point District	
Stepovak Bay Section	15
Swedania Point-Balboa Bay Section	[b]
Point Aliaksin-Beaver Bay Section	[b]
General Section (Shumagin Islands)	[b]
Pavlof District	
Canoe Bay Section	45
Pavlof Bay Section	[b]
Seal Cape-Wosnesenski Section	[b]
General Section (Volcano Bay)	[b]
King Cove District	
Belkofski Section	[b]
Deer Passage Section	[b]
Cold Bay Section	[b]
General Section	[b]
South Peninsula Total	60

-Continued-

Table 4. (page 2 of 3)

Management Area	Sac Roe Guideline Harvest In Short Tons
Aleutian Islands	
Unimak District	[b]
Akutan District	[b]
Unalaska District	[b]
Umnak District	[b]
Adak District	[b]
Guideline Harvest Total[g]	100-250

[a] The Aleutian Islands Management Area is open for exploration; no deliveries have ever been made from the Aleutian Islands. Portions of a section, district, or area may be closed if it is suspected that additional harvests in a given location will exceed 20% of the spawning biomass.

[b] All areas without guideline harvest levels are open for exploration. Harvests in these areas will be kept small until ADF&G is able to document the spawning biomass. For the General Section of the Sand Point District (Shumagin Islands), Seal Cape-Wosnesenski Section, The General Section of the King Cove District, Amak District, Western Section of the Port Moller District, and the Aleutian Islands, no more than 50 tons of herring will be allowed to be harvested from the waters near any single island or bay in exploratory areas unless ADF&G documents a herring biomass that would allow a larger harvest.

[c] Herring abundance in the Port Moller District is difficult to document. The 1998 herring abundance may justify a larger catch than 150 tons, however to increase the guideline harvest level a larger than expected spawning biomass must be documented by ADF&G. A sliding scale exploitation rate was used to determine the 1998 GHL.

Stock Size (Short Tons)	Sliding Scale Exploitation Rate	Allowable Harvest
< 1,000	0%	0
1,001-1,500	10%	0-150
1,501-1,999	10%	150-200
2,000-2,500	15%	300-375
2,501-3000	15%	375-450
>3000	20%	>450

[d] Herring harvested in the Deer Island Section of Herendeen Bay will be counted against the Herendeen Bay guideline harvest level.

[e] Herring harvested along the Bering Sea Coast will be counted against the Port Moller and Herendeen Bays guideline harvest level if it is suspected that these herring were traveling into Port Moller or Herendeen Bays.

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[f] In 1992, commercial quantities of herring were harvested for the first time in the Port Heiden District. The 1998 herring abundance may justify a catch larger than 50 tons, however to increase the guideline harvest level a larger than expected spawning biomass must be documented by ADF&G. The commercial herring fishery will be managed conservatively until adequate data is obtained to warrant a liberal management approach. Herring harvested along the Bering Sea coast will be counted against the Port Heiden guideline harvest level if it is suspected that these herring were travelling in to Port Heiden Bay.

[g] Total does not include harvests that may occur in areas open to exploration.

Table 5. Aleutian Islands area "Dutch Harbor" food and bait herring fisheries historical summary, 1929-98.

Year	Harvest in Short Tons	Number of Processors	Number of Vessels Making Landings	Number Landings	Tons Per Boat	Tons Per Landing	Price Per Ton	Exvessel Value (Thousands)	Exvessel Value Per Vessel (Thousands)
1929	1,259				Information not Available				
1930	1,916				Information not Available				
1931	1,056	12	26		Information not Available				
1932	2,510	12	30		Information not Available				
1933	1,585	12	38		Information not Available				
1934	1,533	9			Information not Available				
1935	2,412	10			Information not Available				
1936	1,379	8			Information not Available				
1937	579				Information not Available				
1938	513				Information not Available				
1939-44	No Fishery								
1945	75				Information not Available				
1946-80	No Fishery								
1981	704	[a]	[a]	16	352	44	300	211	[a]
1982	3,565	6	7	95	509	38	300	1,020	146
1983	3,567	5	8	96	446	37	232	828	104
1984	3,578	5	9	61	398	59	210	751	83
1985	3,480	[a]	6	78	560	45	162	564	94
1986	2,394	4	7	53	342	45	254	600	86
1987	2,503	4	8[b]	45	373	56	300	751	94
1988	2,004	6	8[b]	59	251	34	252	505	63
1989	3,081	5	9[b]	69	342	45	283	873	97
1990	820	5	7	8	117	103	350	287	41
1991	1,325	5	8	18	166	74	300	398	50
1992	1,949	5	11	26	177	75	300	573	52
1993	2,790	4	13	32	215	87	300	837	64
1994	3,349	7	14	65	239	52	300	1,005	72
1995	1,748	6	14	24	125	73	300	524	37
1996	2,239	6	24 (26)[c]	29	93	77	300	672	28
1997	1,950	5	26	63	75	31	300	585	23
1998	1,994	3	22	22	91	91	300	598	27
1929-38 Average	1,474	11	31		Information not Available				
1989-1998 Average	2,125	5	15	36	164	71	303	635	49

[a] This information can not be released due to state confidentiality requirements.

[b] The catch by gear type can not be released due to state confidentiality requirements or is not available.

[c] CFEC permit holders making successful landings.

Table 6. Aleutian Islands area "Dutch Harbor" commercial food and bait herring fishery, including landing date, days fished, preseason Togiak spawning biomass, guideline harvest level, harvest, and number of vessels fishing, 1981-98.

Year	Landing Date First	Landing Date Last	Days fished	Preseason Togiak Spawning Biomass Short Tons	GHL's Short Tons	Food & Bait Harvest Short Tons	% Togiak Spawning Biomass Harvested	Number Vessels Fishing
1981	Aug 3	Aug 23	21	159,000	None	704	0.4	[a]
1982	Aug 5	Sep 12	39	98,000	None	3,565	3.6	7
1983	Jul 23	Sep 6	46	142,000	3,525[b]	3,567	2.5	8
1984	Jul 17	Jul 27	11	115,000	3,525[b]	3,578	3.1	9
1985	Jul 17	Aug 11	26	132,000	3,525[b]	3,480	2.6	6
1986	Jul 16	Jul 28	13	96,000	2,453[c]	2,394	2.5	7
1987	Jul 16	Jul 23	4[d]	88,000	2,332[c]	2,503	2.8	9
1988	Jul 16	Sep 18	21	132,000	3,100[e]	2,004	1.6	8
1989	Jul 16	Aug 5	19[f]	100,108	3,100[e]	3,081	3.2	9
1990	Aug 15	Aug 15	<1	72,000	903[e]	820	1.1	7
1991	Jul17[g]	Jul 17	<1	83,229	931[e]	1,325	1.6	8
1992	Jul 16	Jul 28[h]	5	60,214[i]	1,940[i]	1,949	1.3	11
1993	Jul 16	Jul 16	<1	164,135	2,193	2,790	1.7	13[k]
1994	Jul 16	Jul 19	4	165747[j]	2,215[j]	3,349	2.0	16[k]
1995	Jul 16	Jul 16	<1	149,093	1,982	1,748	1.2	18[k]
1996	Jul 16	Jul 16	<1	135,585	1,793	2,239	1.7	25[k]
1997	Jul 15[l]	Jul 19	5	125,000	1,645	1,950	1.2	26[k]
1998	Jul 16	Jul 16	<1	121,054	1,590	1,994	1.6	22

[a] Number may not be released due to state confidentiality requirements.

[b] Harvest ceiling of 3,525 established by Alaska Board of Fisheries.

[c] Harvest quota set by ADF&G. Reduced proportionately with the drop from the 1985 Togiak spawning biomass level.

[d] Closed July 19 reopened for 14 hours on July 23.

[e] Harvest quota set under provisions of the Bering Sea Herring Fisheries Management Plan.

[f] Closed July 26, reopened July 27 through August 5.

[g] Fishery opened for six hours on July 16; weather prevented any fishing effort.

[h] Fishery co-op after July 16.

[i] The preseason forcasted biomass was adjusted by ADF&G, the final biomass estimate for Togiak was 146,037 tons and the harvest quota was adjusted to 1,940 tons.

[j] The preseason forcasted biomass was adjusted by ADF&G (Kathy Rowell, personal communication, May 25, 1994).

[k] Number of vessels registered to fish.

[l] Fishery opened at 10:00 p.m.

Table 7. Alaska Peninsula sac roe herring harvest, number of landings and permits fished by year, 1979-98.

Year	North Peninsula			South Peninsula			Total		
	Tons	Landings	Permits Fished	Tons	Landings	Permits Fished	Tons	Landings	Permits Fished
1979	No Harvest			[a]	[a]	[a]	[a]	[a]	[a]
1980	No Harvest			453.8	15	6	453.8	15	6
1981	No Harvest			797.4	93	56	797.4	93	56
1982	[a]	[a]	[a]	138.3	13	4	[a]	[a]	[a]
1983	627.0	47	23	0.0	0	0	627.0	47	23
1984	431.2	20	11	210.4	20	5	641.6	40	15
1985	710.2	31	17	287.8	8	5	998.0	39	20
1986	894.4	116	50	281.9	14	6	1,176.3	130	51
1987	513.8	46	27	319.0	8	[a]	832.8	54	27
1988	294.3	21	9	376.7	22	10	671.0	43	19
1989	729.0	24	10	310.3	31	13	1,039.2	55	19
1990	272.8	23	5	312.2	31	6	585.1	54	9
1991	1,313.0	59	11	157.4	26	10	1,470.5	85	18
1992	3,969.0	100	24	180.3	11	7	4,149.3	112	29
1993	535.9	44	16	[a]	[a]	[a]	[a]	[a]	[a]
1994	89.8	7	5	[a]	[a]	[a]	[a]	[a]	[a]
1995	337.3	37	12	[a]	[a]	[a]	[a]	[a]	[a]
1996	[a]	[a]	[a]	124.4	8	4	[a]	[a]	[a]
1997	No Harvest			No Harvest			No Harvest		
1998	[a]	[a]	[a]	No Harvest			[a]	[a]	[a]
1989-98 Average									
	741.1	31	9	125.2	13	5	866.3	44	12

[a] Number can not be released due to state confidentiality requirements.

Table 8. North Peninsula aerial herring biomass surveys, 1998.

	Port Moller District						Port Heiden District		
	Herendeen Bay[a] Section		Port Moller Bay[b] Section		Bear River to Strogonof Point		Port Heiden Bay Section		Total
Date	Tons[c]	Rating[d]	Tons[c]	Rating[d]	Tons[c]	Rating[d]	Tons[c]	Rating[d]	(Tons)
May 11	0	n/a	0	n/a					0
May 12			0	n/a	80	n/a			80
May 13	430	2	15	3	0	4			445
May 16	30	2	0	5					30
May 18	25	2	0	4	0	4			25
May 19	0	1	90	1					90
May 20	20	n/a	60[e]	n/a	0	n/a			20
May 21	275[e]	n/a	0	n/a					0
May 23	295	n/a	0	n/a					295
May 26			30	n/a					30
May 28					200	n/a			200
May 29			0	n/a	80	n/a			80
June 03	130	3	0	3					130
Total Biomass Observed	930		135		360		0		1,425

[a] Herendeen Bay includes both the Herendeen Bay and Deer Island-Mud Bay Sections.
[b] Port Moller Bay includes both the Inner and Outer Port Moller Bay Sections.
[c] Tons observed; Method of biomass estimate varied based on experience of the observer.
[d] Rating of survey: (1) Excellent, (2) Good, (3) Fair, (4) Poor, (5) Unsatisfactory
[e] Not used in calculating Total Biomass. These surveys are considered to be duplicates of adjacent days.

Table 9. North Peninsula aerial herring biomass surveys, historical summary, 1980-1998.

	Port Moller District				Port Heiden District			
Date	Herendeen Bay[a] Section Tons[c]	Port Moller Bay[b] Sections Tons[c]	Additional Biomass Harvested Tons[c]	Bear River to Strogonof Point Tons[c]	Port Heiden Bay Section Tons[c]	Total Biomass Estimate Tons[c]	Aerial Survey Dates Begin	End
1980				NO AERIAL SURVEY				
1981				NO AERIAL SURVEY				
1982				SURVEY INFORMATION NOT AVAILABLE				
1983				SURVEY INFORMATION NOT AVAILABLE				
1984	2,000	1,500-1,900				3,500-3,900	May 9	July 31
1985	260	1,305		5,240		6,805	May 1	June 13
1986	1	28		0		29	May 16	June 7
1987	0	5,125		0		5,125	May 6	June 3
1988	1,737	442		8		2,187	May 17	June 15
1989	1,163	1,471				2,634	May 19	June 16
1990	155	387				542	May 21	June 14
1991	2,278 (250)[c]	4,651		1,471		8,400	May 17	June 26
1992	755	8,269		5,798	10,021	24,843	May 19	June 18
1993	775	2,878		33	0	3,686	May 4	June 9
1994	381	274	74	0		729	May 22	May 28
1995	60	477	200	0		737	May 13	June 2
1996	390 (390)[d]	986 (755)[d]		309	65	1,750	May 9	June 18
1997	160	45		0		205	May22	June 12
1998	930	135		360 (200)[c]		1425	May 11	June 3
1989-98 Average	705	1,957		996	3,362	4,495		

[a] Herendeen Bay includes both the Herendeen Bay and Deer Island-Mud Bay Sections.

[b] Port Moller Bay includes both the Inner and Outer Port Moller Bay Sections.

[c] Tons observed; Method of biomass estimate varied based on experience of the observer.

[d] Biomass estimates conducted by commercial spotter pilots are enclosed in parenthesis ( ); these estimates are included in the total biomass estimate. They may not be comparible to ADF&G estimates.

Table 10. Age, sex, weight, and length of herring harvested in the Aleutian Islands "Dutch Harbor" commercial food and bait herring fishery, July 16 1998.

Age	Sample Size			Catch (Percent)			Weight		Length	
							Mean	SD	Mean	SD
Years	Male	Female	Total	Male	Female	Total	(g)	(g)	(mm)	(mm)
5	17	20	37	0.06	0.07	0.07	244	22.1	252	6.7
6	18	27	45	0.06	0.10	0.08	271	36.4	259	9.1
7	75	69	144	0.26	0.25	0.25	304	32.4	269	8.3
8	80	68	148	0.28	0.24	0.26	313	31.7	274	8.1
9	25	23	48	0.09	0.08	0.08	333	37.7	280	9
10	49	34	83	0.17	0.12	0.15	346	39.7	283	10
11+	26	37	63	0.09	0.13	0.11	369	55.2	291	13.5
Total	290	278	568	0.51	0.49	1.00	316		274	

Table 11. Estimated age composition of Aleutian Islands commercial purse seine food and bait herring harvests, in percent, 1991-98.

	Percent at Age (Years)													
Year	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1991	0.2	0.2	0.2	8.7	11.0	5.7	13.4	11.2	22.1	17.2	8.9	1.0	0.0	0.2
1992	0.0	0.3	0.2	0.3	23.3	25.0	4.8	15.2	8.9	10.0	9.4	2.5	0.2	0.0
1993	0.3	9.5	51.8	5.1	5.9	13.2	6.2	2.5	1.6	1.7	1.3	0.8	0.0	0.0
1994	0.2	1.7	24.3	36.7	3.8	4.0	13.3	6.5	3.6	3.3	1.0	0.9	0.9	0.0
1995	0.2	3.2	5.6	30.4	27.5	4.5	4.3	10.4	5.0	1.9	4.8	1.4	0.6	0.2
1996	0.0	0.7	8.2	16.1	35.8	25.8	3.3	2.9	2.7	1.6	1.5	0.8	0.4	0.2
1997	0.0	3.2	15.2	31.3	9.3	21.2	9.5	1.8	4.5	1.6	1.2	0.5	0.1	0.0
1998	0.0	0.07	0.08	0.25	0.26	0.08	0.15	0.11[a]						

[a] Age determination in 1998 calculated the proportion of 11 and older aged fish in one category.

Table 12. Age, sex, weight, and length of herring harvested on the North Peninsula commercial sac roe fishery by area, 1998.

Age (Years)	Sex			Total	Percent of Total	Weight			Std. Length		
	Male	Fem	Unk			Mean (gm)	Std. Dev.	Number Weighed	Mean (mm)	Std. Dev.	Number Measured
Inner Port Moller Bay											
4	3	2	0	5	6.4	158	20.2	5	231	14.1	5
5	22	28	0	50	64.9	196	19	50	242	8.2	50
6	3	1	0	4	5.1	202	58	4	247	15.3	4
7	6	3	0	9	11.6	263	30.9	9	263	10.4	9
8	2	3	0	5	6.4	317	13.2	5	282	8.2	5
9	0	2	0	2	2.5	349	20.5	2	279	0	2
10	2	0	0	2	2.5	332	48	2	287	9.8	2
Total	38	39	0	77	100	217	52.7	77	249	16.8	77
Outer Port Moller Bay											
2	0	1	0	1	0.4	86	0	1	180	0	1
3	1	2	0	3	1.4	142	9.8	3	223	8	3
4	3	6	0	9	4.3	168	21.5	9	234	9.6	9
5	43	42	0	85	40.8	199	27.5	85	247	10.1	85
6	16	12	0	28	13.4	220	28.9	28	255	9.3	28
7	12	25	0	37	17.7	263	40.6	36	266	12.5	37
8	11	9	0	20	9.6	303	28.8	20	280	7.9	20
9	4	5	0	9	4.3	349	41.8	9	284	12.4	9
10	4	5	0	9	4.3	338	81.5	9	286	18	9
11+	3	4	0	7	3.3	374	49.4	7	293	10.2	7
Total	97	111	0	208	100	239	66.7	207	258	20.1	208
Bear River Section											
5	13	12	0	25	67.5	210	36.3	25	245	9.6	25
6	2	0	0	2	5.4	241	51.6	2	257	13.4	2
7	2	4	0	6	16.2	274	35.1	6	267	13.1	6
8	1	0	0	1	2.7	226	0	1	0	0	0
9	0	1	0	1	2.7	314	0	1	286	0	1
10	0	2	0	2	5.4	397	2.1	2	296	0	2
Total	18	19	0	37	100	235	58.7	37	253	17.5	36

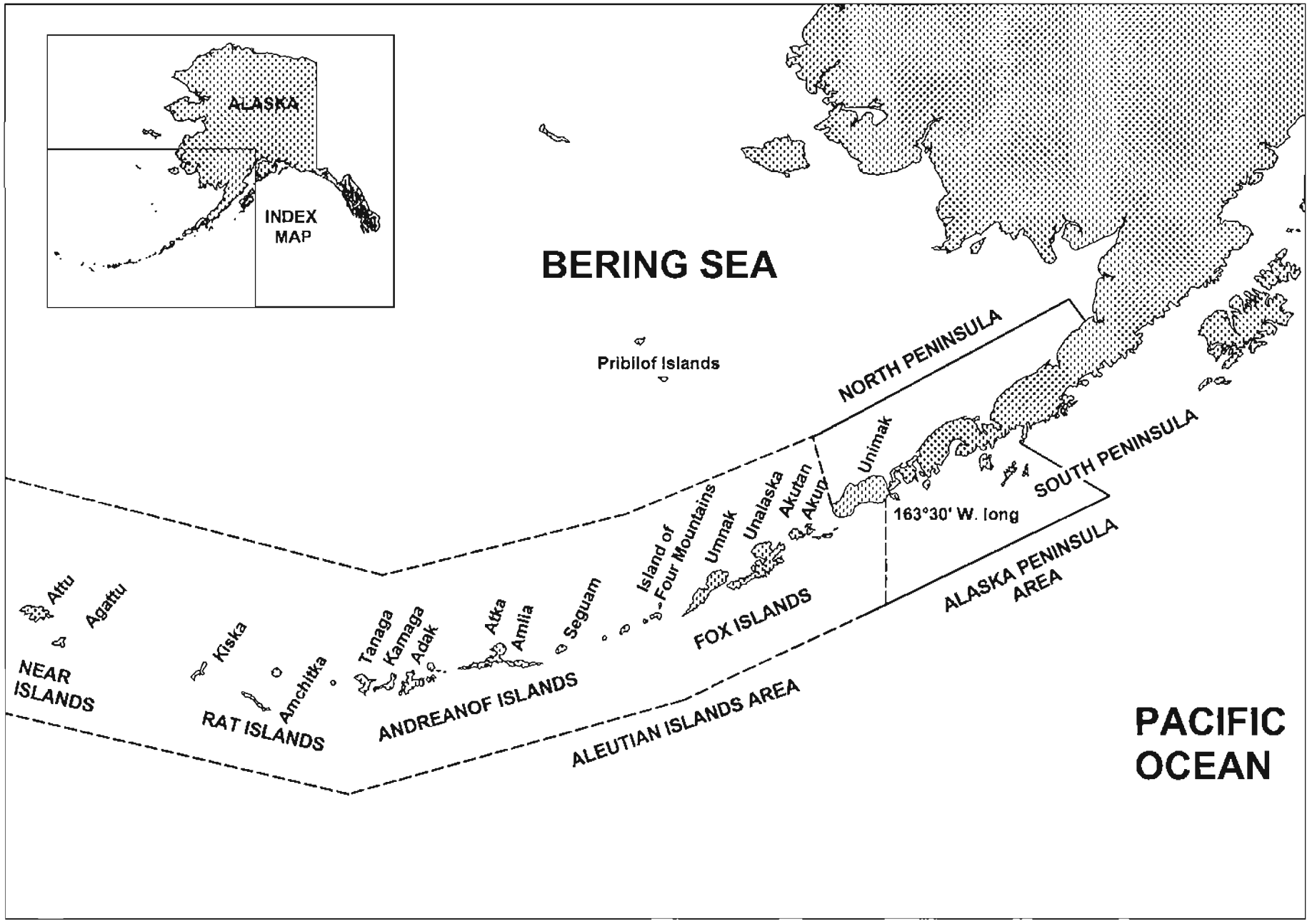

Figure 1. Map of the Aleutian Islands and Alaska Peninsula Areas.

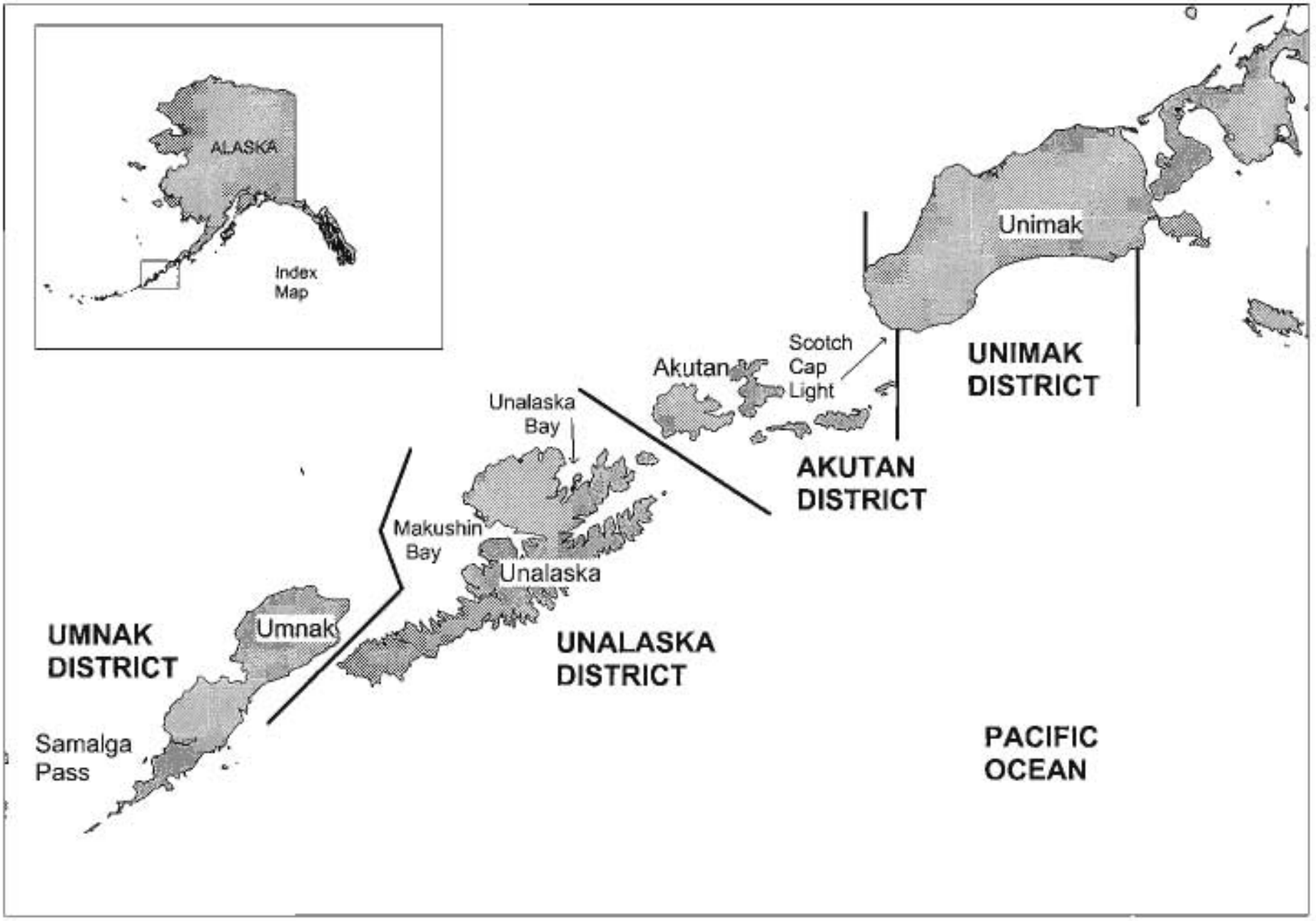

Figure 2. Map of the Aleutian Islands, "Dutch Harbor" Management Area, from Samalga Pass to Unimak Island with fishing districts shown.

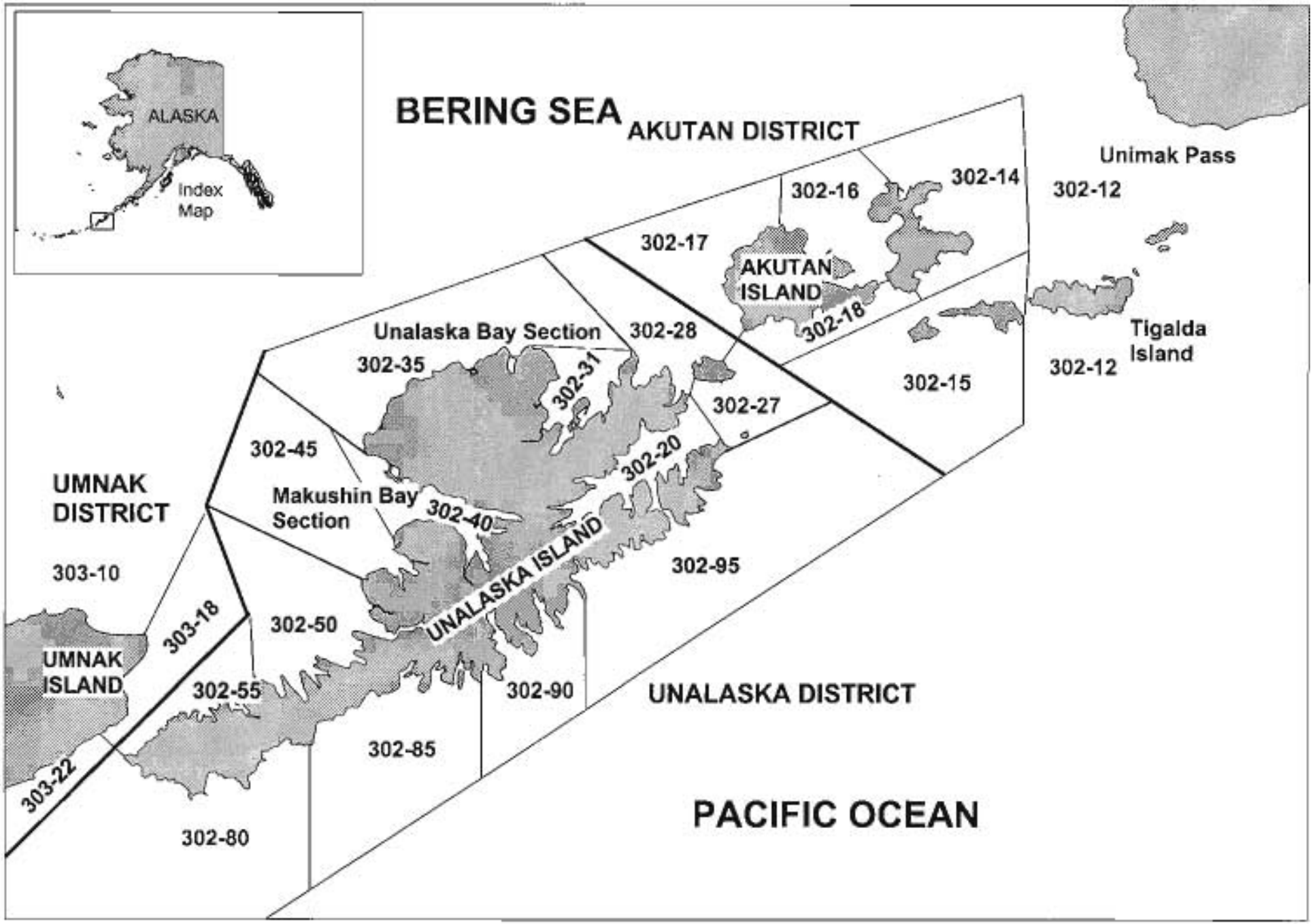

Figure 3. Map of the Aleutian Islands Area from Tigalda Island to Umnak Island with the statistical herring fishing areas shown.

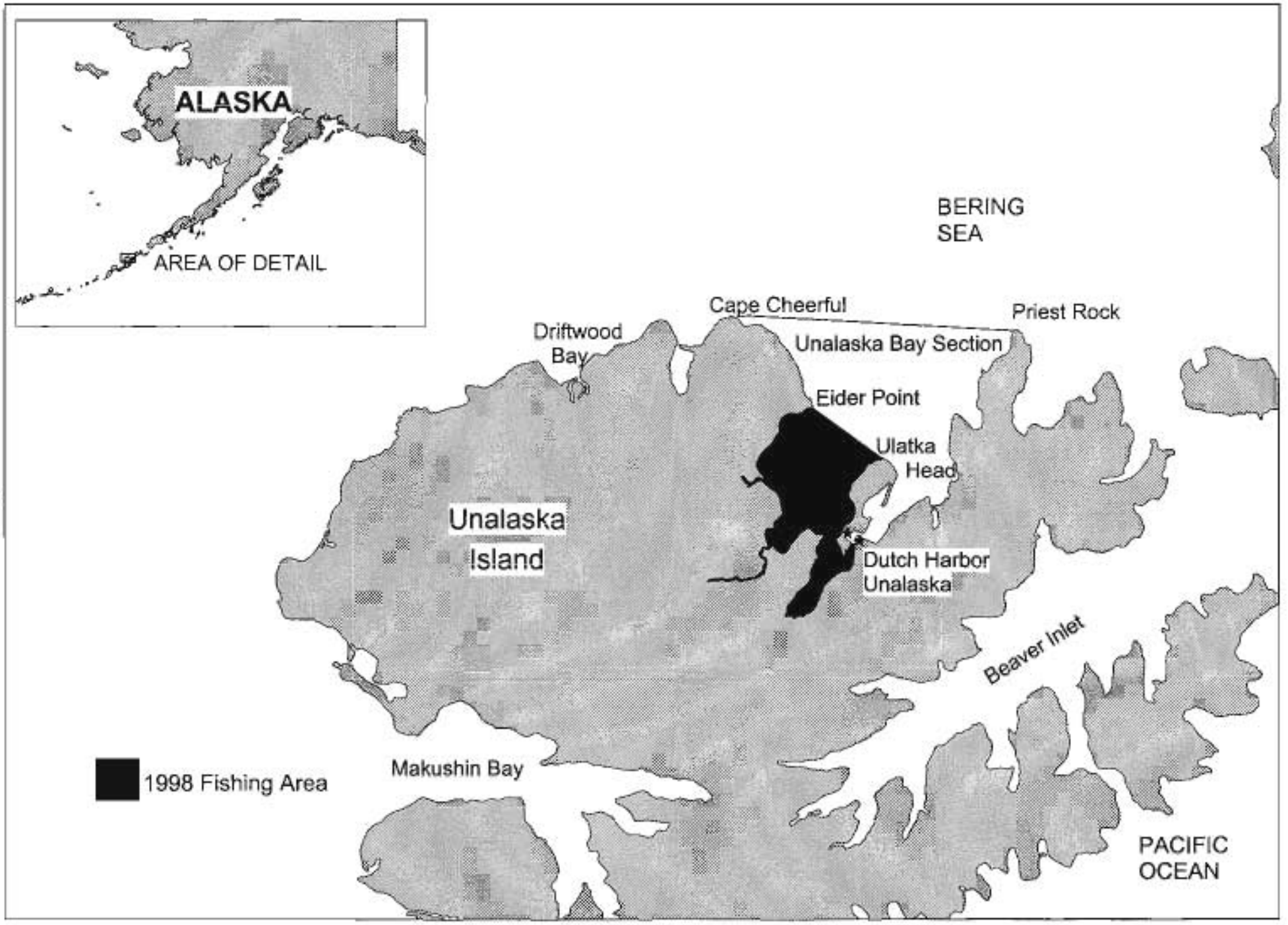

Figure 4. Map of Unalaska Island from Beaver Inlet to Makushin Bay, with the 1998 fishing area defined.

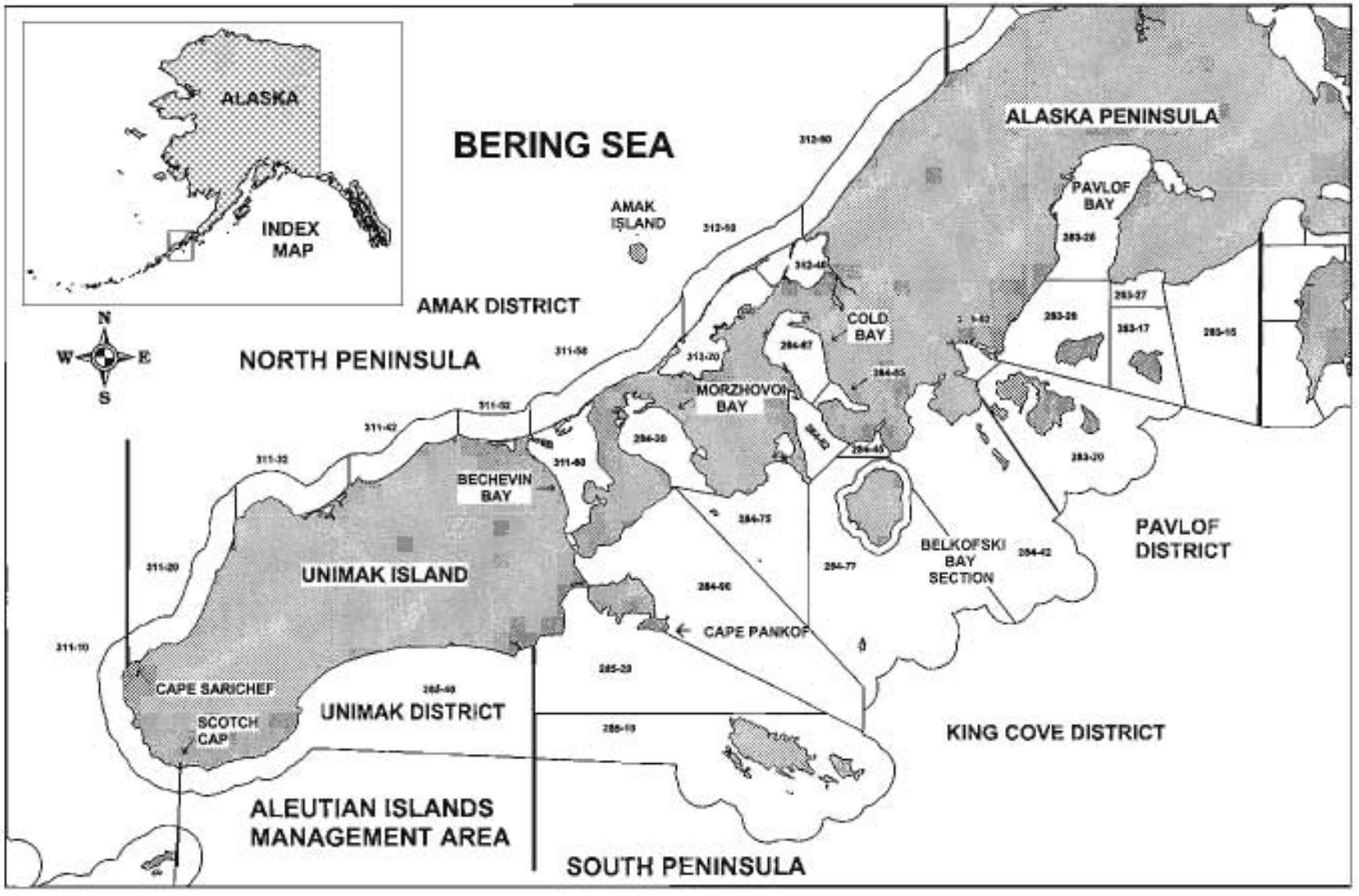

Figure 5. Map of the Alaska Peninsula Area from Cape Sarichef to Pavlof Bay with the statistical herring fishing areas shown.

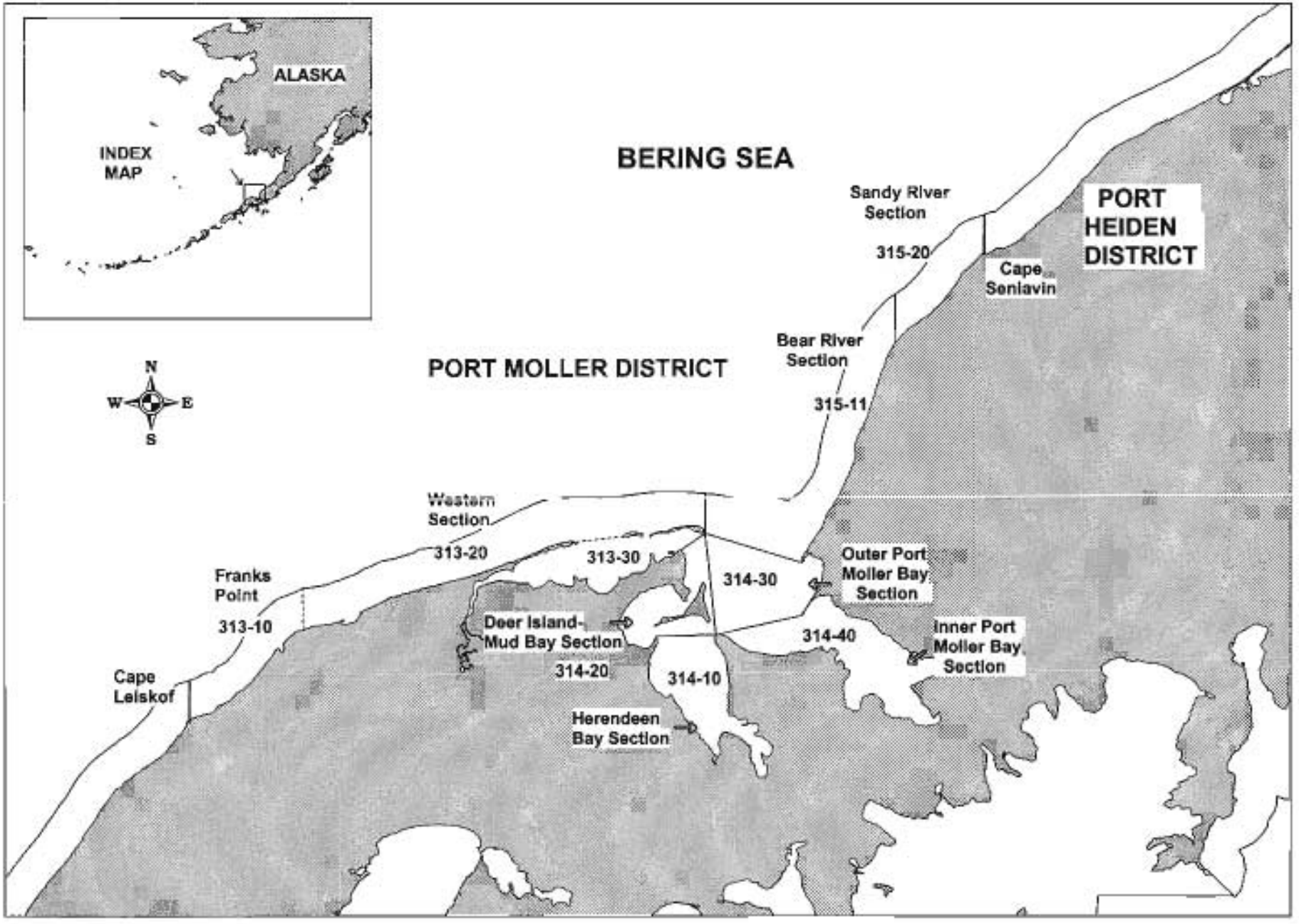

Figure 6. Map of the Port Moller District with the statistical herring fishing areas shown.

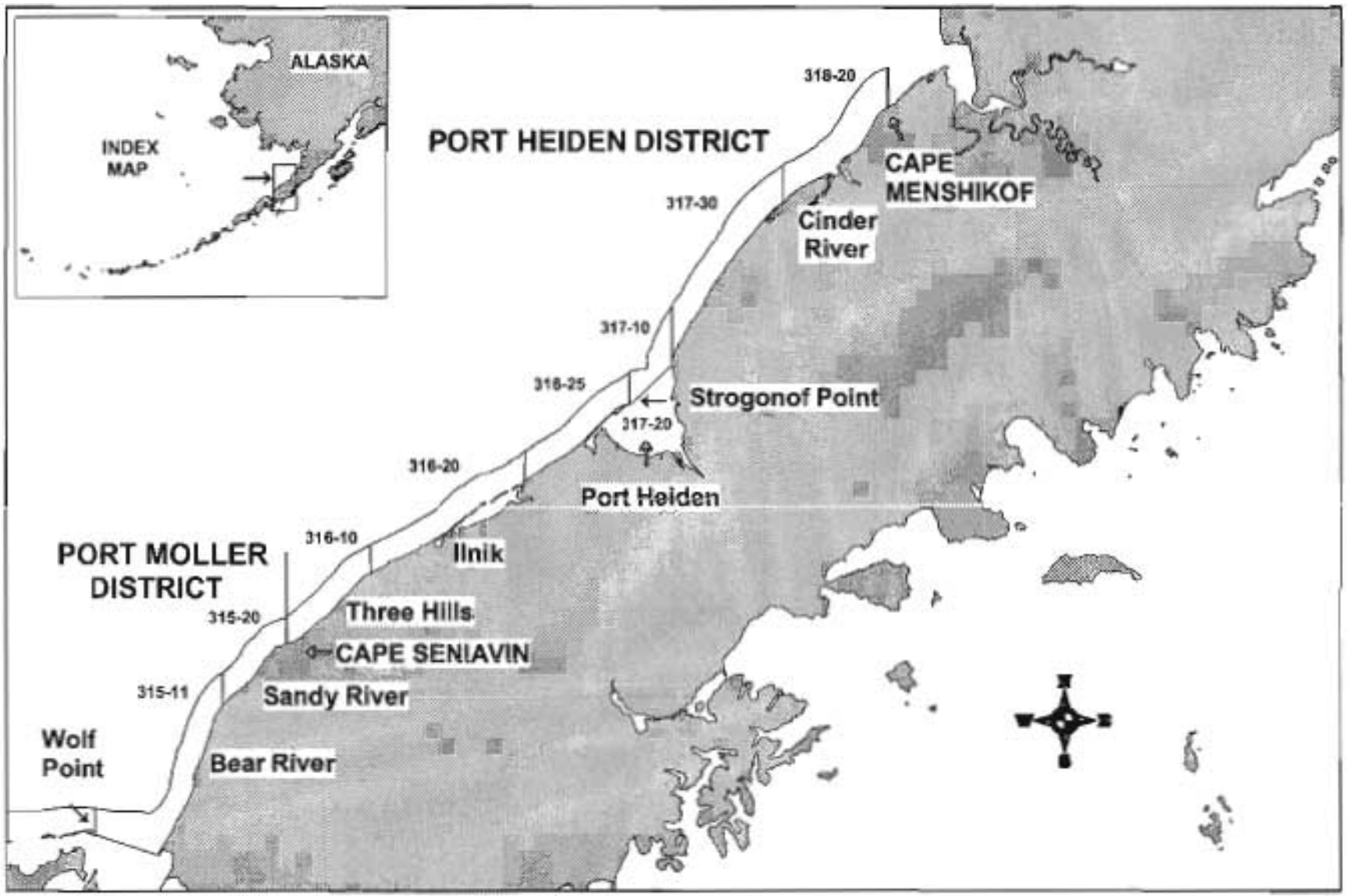

Figure 7. Map of the Alaska Peninsula Area from Entrance Point to Cape Menshikof with the statistical herring fishing areas shown.

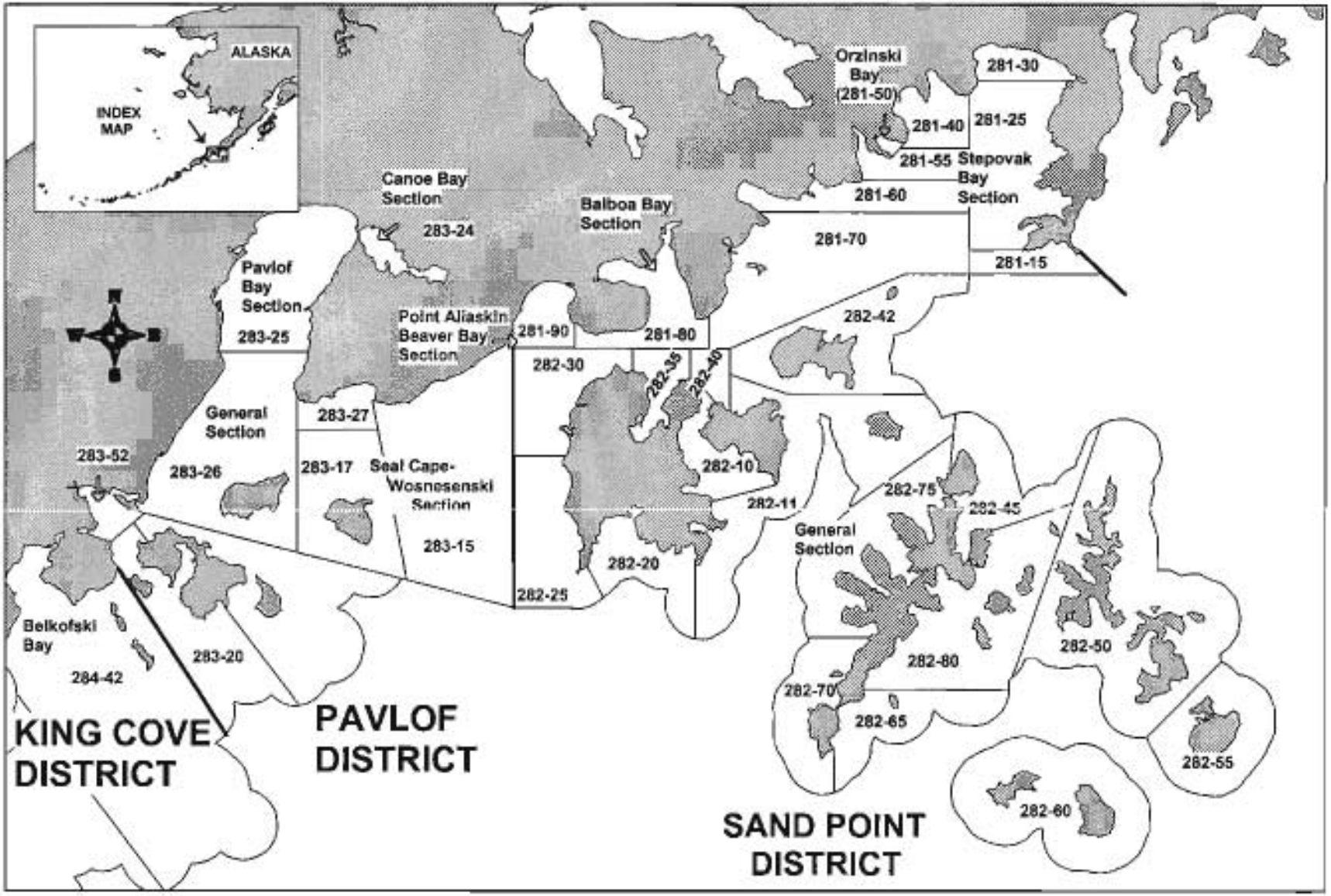

Figure 8. Map of the Alaska Peninsula Area from Belkofski Bay to Kupreanof Point with the statistical herring fishing areas shown.

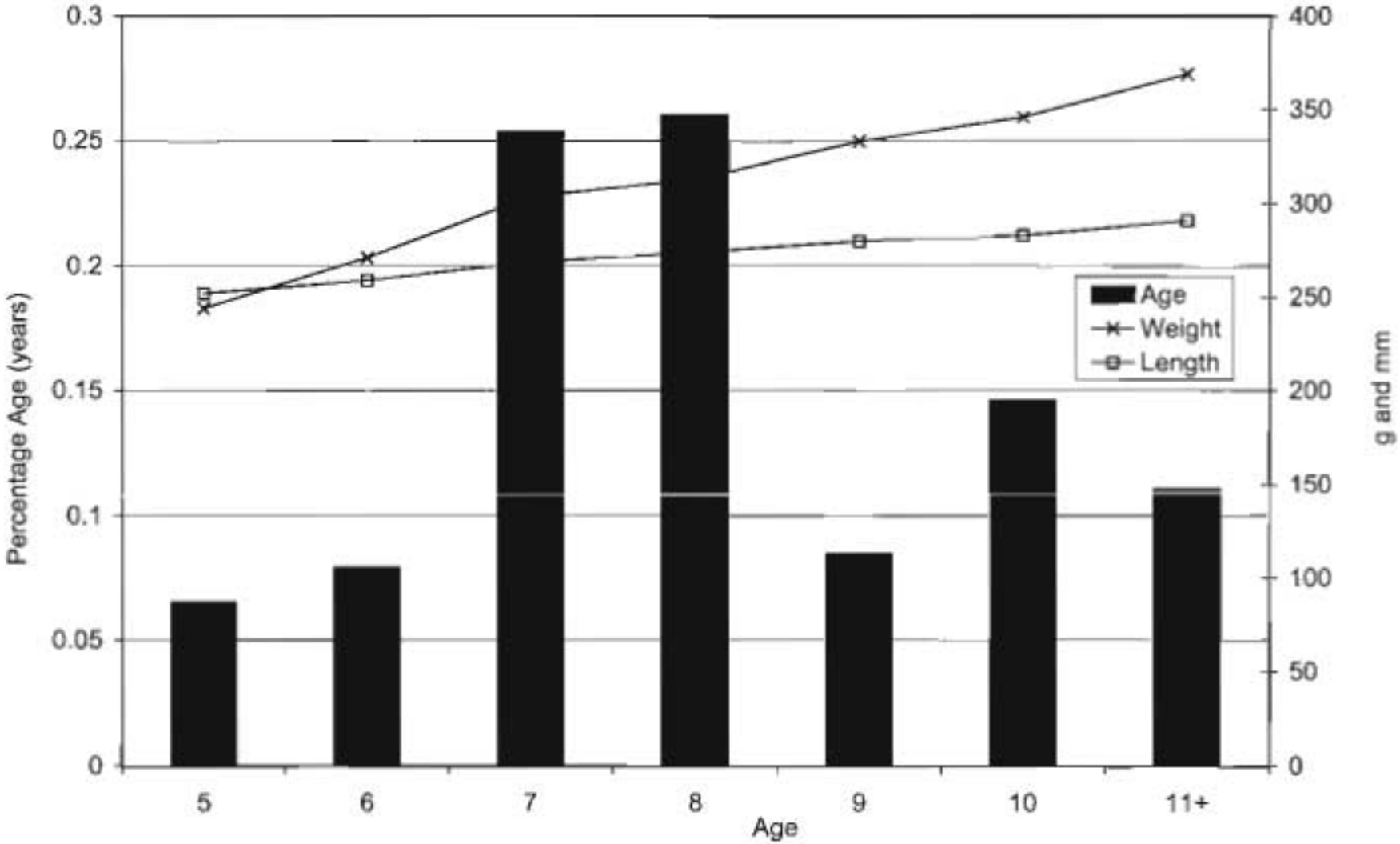

Figure 9. Average length at age (mm), average weight at age (g), and percent of each age class present in the "Dutch Harbor" Management Area, food and bait herring fishery, 1998.

APPENDIX

Appendix A. Emergency order summary, 1998.

ALEUTIAN ISLANDS MANAGEMENT AREA

EMERGENCY ORDER NO. 4-FH-M-SP-01-98

EFFECTIVE DATE: 12:01 a.m. April 15, 1998

EXPLANATION: This emergency order establishes commercial sac roe herring fishing periods as follows for the Alaska Peninsula and Aleutian Islands Management Areas:

(1) South Peninsula: Sand Point, Pavlof, and King Cove Districts.

From April 15 through July 15 herring may be taken during fishing periods starting at 12:00 noon on odd number days of the month and closing at 12:00 noon on even days of the month, followed by 24 hour closed periods.

(2) Aleutian Islands: Unimak, Akutan, Unalaska, Umnak, and Adak Districts.

Effective at 12:01 a.m. April 15 through 12:00 midnight June 15 herring may be taken. The season is closed from June 16 through 12:00 noon on July 15.

(3) North Peninsula: Amak, Port Moller, and Port Heiden Districts.

(a) Amak District.

Effective at 12:01 a.m. April 15 through 12:00 midnight June 30 herring may be taken. The season is closed from July 1 through July 15.

(b) Port Moller and Port Heiden Districts.

From April 15 through June 30 herring may be taken only during periods established by subsequent emergency order(s). The season is closed from July 1 through July 15.

JUSTIFICATION:

Fishing time is needed to allow sac roe herring harvests in the Alaska Peninsula and Aleutian Islands Management Areas during the sac roe herring season. Effort is anticipated to be low in Aleutian waters and the Amak District of the North Peninsula. These two areas are open for exploration because no commercial sac roe herring deliveries have been made in the Aleutian Islands, and the Amak District of the North Peninsula has had no deliveries in recent years. Therefore, until harvests indicate more conservative measures are needed, seven fishing days per week can be allowed, while limiting the harvest to no more than 25 tons, without causing stock conservation concerns in Aleutian waters and the Amak District of the North Peninsula.
The reason that portions of the area will remain closed during part of the sac roe herring season is as follows:

Unimak, Akutan, Unalaska, Umnak, and Adak Districts during June 16 through July 15:

These districts are managed on a food and bait herring fishery allocation during the food and bait season beginning at 12:00 noon on July 15. The food and bait fishery is managed on the basis of 5 AAC 27.060 Bering Sea Herring Fishery Management Plan. During some years food and bait stocks (non local spawning stocks) are present in these areas by June 16. The closure from June 16 through July 15 will prevent food and bait herring from being harvested prior to the

-Continued-

food and bait season. If sac roe stocks are discovered during the June 16 through July 15 time period, appropriate locations can be opened for a sac roe herring harvest by subsequent emergency order(s).

South Peninsula: Sand Point, Pavlof, and King Cove Districts during April 15 through July 15:

These districts are managed on local sac roe herring stocks. During recent years, fishing effort has fluctuated and the department's ability to monitor the fishery has diminished. Therefore, to avoid overharvest these districts will be opened for 24 hour periods, followed by 24 hour closures.

Port Moller and Port Heiden Districts during April 15 through June 30.

These districts are managed on local sac roe herring stocks. Fishing effort has increased, in recent years, and the department must closely monitor these fisheries to prevent overharvest. Therefore, the department will keep these districts closed until it is confident the estimated mature herring biomass threshold of 1,000 tons is assured, and fishing vessels and adequate tender capacity are on the grounds.

Port Heiden, Port Moller, and Amak District during July 1 through July 15:

These districts are managed on local sac roe herring stocks. During some years non-local, spawned-out herring are present in coastal waters by July 1. The closure from July 1 through July 15 will prevent the harvest of any non-local, spawned-out herring. If sac roe stocks are discovered during the July 1 through July 15 time period, appropriate locations can be opened for a sac roe herring harvest by subsequent emergency order(s).

EMERGENCY ORDER NO. 4-FH-M-SP-02-98

EFFECTIVE DATE: 9:30 p.m. Thursday July 16, 1998

EXPLANATION: This emergency order allows a 30 minute commercial food and bait herring fishing period in the Unalaska District of the Aleutian Islands Management Area, from 9:30 p.m. to 10:00 p.m., Thursday, July 16, 1998 in all waters of Unalaska Bay south of a line from Eider Point at 53°57.5' N. lat, 166°35.25'W. long. to Ulakta Head at 53°55.47' N. lat., 166°30.55' W. long. and south of the Dutch Harbor-Unalaska bridge.

JUSTIFICATION:

The "Dutch Harbor" food and bait herring fishery is managed on the basis of the Togiak herring biomass as described under 5 AAC 27.060, the Bering Sea Herring Management Plan. The department shall manage the Dutch Harbor fishery so that it is allocated seven percent of the allowable Togiak District herring sac roe harvest determined under the provisions of the Bristol Bay Herring Management Plan (5 AAC 27.865).

The 1998 Dutch Harbor food and bait herring allocation is 1,590 tons. Effort consists of 24 purse seine vessels, 14 tenders representing 3 processing companies, and 7 aircraft. The initial holding capacity for both tenders and purse seiners is an estimated 4,000 tons. Based on department aerial surveys herring are present in the Unalaska Bay Section. A 30 minute opening in the described waters will allow the fleet the opportunity to harvest herring toward the food and bait allocation.

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EMERGENCY ORDER NO. 4-FH-M-SP-03-98

EFFECTIVE DATE: 10:00 a.m. Friday July 17, 1998

EXPLANATION: This emergency order closes the Aleutian Islands Management Area commercial food and bait herring fishing season effective 10:00 a.m. Friday July 17, 1998 until 12:00 midnight February 28, 1998 (the end of the food and bait herring season).

JUSTIFICATION:

Preliminary catch estimates from July 16 indicate that approximately 2,000 tons were harvested during the commercial fishing period. An estimated 410 tons were caught above the 1,590 ton allocation. Because the allocation has been exceeded, there will be no more fishing periods for the 1998 "Dutch Harbor" food and bait herring fishery.

ALASKA PENINSULA MANAGEMENT AREA

EMERGENCY ORDER NO. 4-FH-M-PM-01-98

EFFECTIVE DATE: 5:00 p.m., Wednesday May 20, 1998

EXPLANATION: This emergency order allows a three hour commercial herring fishing period from 5:00 p.m. Wednesday May 20, 1998 until 8:00 p.m. Wednesday May 20, 1998 in the Port Moller District.

JUSTIFICATION:

The herring guideline harvest in the Port Moller District remains at 150 tons with no commercial fishery to date. Biomass estimate aerial surveys were first conducted on May 11, with a minimum known biomass estimate to date of 752 tons. Effort levels in the Port Moller District consists of only three vessels.

A three hour fishing period from 5:00 p.m. until 8:00 p.m. Wednesday, May 20, 1998 should give fishers the opportunity to catch herring, if they enter the district during this period, without exceeding the processing capacity of the one registered company on the grounds which is only 100 tons. The department will continue to manage the fishery to assure a spawning biomass of 1,000 tons in the Port Moller District by the latter part of June.

EMERGENCY ORDER NO. 4-FH-M-PM-02-98

EFFECTIVE DATE: 6:00 a.m. Wednesday May 27, 1998

EXPLANATION: This emergency order allows a 36 hour commercial herring fishing period from 6:00 a.m. Wednesday May 27, 1998 until 6:00 p.m. Thursday May 28, 1998 in the Port Moller District

JUSTIFICATION:

The herring guideline harvest in the Port Moller District remains at 150 tons with no commercial harvest to date. The first commercial herring fishery during 1998 occurred on May 20 and yielded no harvest. Biomass estimate aerial surveys were first conducted on May 11, with a minimum known biomass estimate to date of 1,342 tons, exceeding the 1,000 ton threshold. At the present biomass level, the allowable harvest is 0-150 tons. Market availability among the three purse seine vessels will only permit a harvest of 100 tons.

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A thirty six hour fishing period from 6:00 a.m. Wednesday, May 27 until 6:00 p.m. Thursday, May 28, 1998 should give fishers the opportunity to harvest 100 tons of herring, if fish enter the district during this period, without exceeding the processing capacity of the one registered company. It appears this is the last opportunity for a herring harvest in the Port Moller District during 1998, since the one registered buyer is not expected to purchase herring after this fishing period.

EMERGENCY ORDER NO. 4-FH-M-PM-03-98

EFFECTIVE DATE: 6:00 p.m. Thursday May 28, 1998

EXPLANATION: This emergency order extends the commercial herring fishing period in the Port Moller District six hours from 6:00 p.m. Thursday May 28, 1998 until 12:00 midnight Thursday May 28, 1998.

JUSTIFICATION:

The herring guideline harvest in the Port Moller District remains at 150 tons with no commercial harvest to date. The first commercial herring fishery during 1998 occurred on May 20 and yielded no harvest. Biomass estimate aerial surveys were first conducted on May 11, with a minimum known biomass estimate to date of 1,342 tons, exceeding the 1,000 ton threshold. At the present biomass level, the allowable harvest is 0-150 tons. Market availability among the three purse seine vessels will only permit a harvest of 100 tons.

A thirty six hour fishing period from 6:00 a.m. Wednesday, May 27 until 6:00 p.m. Thursday, May 28, 1998 provided little opportunity for a commercial harvest as abundance of herring during this time was low. The harvest was only about 10 tons. A six hour extension of the fishing period is expected to provide opportunity as new herring are entering the Port Moller District as of mid-afternoon on May 28. A six hour extension of the previous fishing period should give fishers the opportunity to harvest 100 tons of herring, without exceeding the processing capacity of the one registered company. It appears this is the last opportunity for a herring harvest in the Port Moller District during 1998, since the one registered buyer is not expected to purchase herring after this fishing period.

EMERGENCY ORDER NO. 4-FH-M-PM-04-98

EFFECTIVE DATE: 6:00 p.m. Tuesday June 2, 1998

EXPLANATION: This emergency order reopens the commercial herring fishing period in the Port Moller District for 24 hours from 6:00 p.m. Tuesday June 2, 1998 until 6:00 p.m. Wednesday June 3, 1998.

JUSTIFICATION:

The herring guideline harvest in the Port Moller District remains at 150 tons with an approximate harvest of 90-95 tons to date. Biomass estimate aerial surveys were first conducted on May 11, with a minimum known biomass estimate to date of about 1,600 tons, exceeding the 1,000 ton threshold. At the present biomass level, the allowable harvest is 150-200 tons. Market availability among the three purse seine vessels will only permit a harvest of 100 tons during this period.

A 24 hour fishing period from 6:00 p.m. Tuesday, June 2 until 6:00 p.m. Wednesday, June 3, 1998 will provide opportunity for a commercial harvest if fish enter the district. The Port Moller District harvest to date is approximately 90 tons. A 24 hour opening in the Port Moller District will provide opportunity for the three vessels to harvest up to 100 tons of herring if they enter the Port Moller District without exceeding the processing capacity of the one registered company. It appears this is the last opportunity for a herring harvest in the Port Moller District during 1998, since the one registered buyer is not expected to purchase herring after this fishing period.

Appendix B. Partial listing of herring regulations, 1998.

ARTICLE 2. - GENERAL SPECIFICATIONS.

5 AAC 27.060. BERING SEA HERRING FISHERY MANAGEMENT PLAN.

(a) The department shall follow the directives of the Bering Sea Herring Management Plan, as well as the regulations that govern the individual herring fisheries, when managing the commercial herring fisheries that take place in the Bering Sea.

(b) Unless otherwise specified in this chapter, the department shall manage the fisheries so that the exploitation rate on eastern Bering Sea herring stocks does not exceed 20 percent of the biomass of those stocks.

(c) The following thresholds are minimum biomass levels for each herring fishing district. When the department estimates, in season, that the biomass in a district is below its threshold, the department may not allow a commercial harvest of herring in that district.

District	Thresholds (s.t.)
Port Moller	1,000
Togiak	35,000
Security Cove	1,200
Goodnews Bay	1,200
Cape Avinof	500
Nelson Island	3,000
Nunivak Island	1,500
Cape Romanzof	1,500
Norton Sound	7,000

(d) The department shall manage the food and bait herring fishery that takes place in the Unimak, Akutan, and Unalaska Districts and that portion of the Umnak District east of Samalga Pass (Dutch Harbor fishery) so that it is allocated seven percent of the allowable Togiak District sac roe herring harvest determined under the provisions of the Bristol Bay Herring Management Plan (5 AAC 27.865).

(g) When the Togiak District is below its threshold, the Dutch Harbor fishery will be closed for that season.

(h) When any of the southwest Alaska herring stocks, from Security Cove to Port Clarence, is below its threshold, identified in (c) of this section, the department shall close the Dutch Harbor food and bait herring fishery for that season. For the purpose of determining the need for this closure, the threshold level for the Nelson Island herring stock is 2,000 short tons. If the department determines it necessary to close the Dutch Harbor food and bait herring fishery under this subsection, the department shall not reallocate the herring harvest set for the Dutch Harbor food and bait herring fishery, under 5 AAC 27.865 (b)(7), to the Togiak sac roe herring fishery.

ARTICLE 12. - STATISTICAL AREA T; BRISTOL BAY AREA

5 AAC 27.865. BRISTOL BAY HERRING MANAGEMENT PLAN

(a) When managing the Bristol Bay commercial herring fishery, the primary objectives of the department will be to prosecute an orderly and manageable fishery, while striving for the highest level of product quality with a minimum of waste.

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(b) To ensure that no gear group is totally disadvantaged, the Board of Fisheries directs the department to take the following actions given the specified circumstances.

(1) When circumstances preclude the department from adequately assessing the biomass, the fishery shall be managed for an exploitation based on the pre-season projected return.

(3) Whenever possible, openings for both gear types must begin during the hours of daylight, and special consideration will be given to afford the maximum amount of daylight.

(4) The department may allow only one gear type to operate in an area during any open period.

(7) The maximum exploitation rate for the Bristol Bay herring stock is 20 percent. Before opening the sac roe fishery, the department shall set aside approximately 1,500 short tons for the Togiak district herring spawn-on-kelp fishery, and seven percent of the remaining available harvest for the Dutch Harbor food and bait fishery.

(8) After the spawn-on-kelp harvest and the Dutch Harbor food and bait fishery have been subtracted, the remaining harvestable surplus is allocated to the sac roe fishery. The department shall manage for a removal of 25 percent of that surplus by the gillnet fleet and 75 percent by the purse seine fleet.

(9) If a manageable separation of the year classes occurs, an exploitation rate of up to 20 percent may be allowed on the younger age herring (4 years or less), and no fishery will be considered if this recruit population is less than 20,000 short tons.

(10) Late season (post-peak) sac roe openings must be based on one or more of the following criteria:

(A) a definable increase in the biomass of herring present on the fishing grounds;

(B) a major shift in the age composition of the herring in a definable biomass that is large enough to allow a harvest; and

(C) a major improvement in the roe maturity of fish sampled over a broad area, indicating the arrival of a quantity of new herring.

ARTICLE 10. - STATISTICAL AREA M; ALASKA PENINSULA-ALEUTIAN ISLANDS AREA.

5 AAC 27.600. DESCRIPTION OF AREA. Statistical area M includes all waters bound on the east by a line extending southeast (135°) from the southernmost tip of Kupreanof Point, on the west by the International Date Line, and on the north by a line extending west from the westernmost tip of Cape Menshikof.

5 AAC 27.605. DESCRIPTION OF DISTRICTS AND SECTIONS.

(a) Sand Point District: all waters on the south (Pacific) side of the Alaska Peninsula west of a line extending from 135° from Kupreanof Point (55°34'N.lat, 159°36' W.long.), and east of 160°59' W.long. (longitude of McGinty Point). Sections are as follows:

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(1) Stepovak Bay Section: all waters of the Sand Point District locatedwest of a line extending 135° from Kupreanof Point 55°34' N.lat., 159°36'W.long., north of a line from approximately two nautical miles south of 135° from Kupreanof Point, west to 55°32'12" N.lat., 160°02'36 W.long., (approximately one nautical mile north of Karpa Island), and west to 55°26' N.lat, 160°31'30" W.long., (approximately two nautical miles south of the longitude of Swedania Point 160°31'30" W.long.).

(2) Swedania Point-Balboa Bay Section: all waters of the Sand Point District located between 160°31'30" W.long. and 160°49' W.long., and north of 55°26' N.lat.

(3) Point Aliaksin-Beaver Bay Section: all waters of the Sand Point District located between 160°49' W.long. and 161°59' W.long., and north of 55°26' N.lat.

(4) General section: all other waters of the Sand Point District.

(b) Pavlof District: all waters on the south (Pacific) side of the Alaska Peninsula between 160°59' W.long. and a line extending 150° from 55°05'54" N.lat., 161°59' W.long. through Inner and Outer Iliasik Islands, including Bear and Volcano Bays.

(1) Canoe Bay Section: all waters of Canoe Bay east of 161°21'45" W.long.

(2) Pavlof Bay Section: all waters of Pavlof Bay north of 55°21'42" N.lat. (latitude of Cape Tolstoi), excluding the Canoe Bay and Seal Cape-Wosnesenski Sections.

(3) Seal Cape-Wosnesenski Section: all waters of the Pavlof District located between 160° 59' W.long. and 161°30" W.long. (longitude of Cape Tolstoi).

(4) General section: all other waters of the Pavlof District.

(c) King Cove District: all waters of the south (Pacific) side of the Alaska Peninsula between a line extending 150° from 55°05'54" N.lat., 161°59' W.long. through Inner and Outer Iliasik Islands and 163°30' W.long., including waters of Isanotski Strait south of a line from Nichols Point to the False Pass dock.

(1) Belkofski Section: all waters of the King Cove District east of 162°15'W.long. (longitude of Bold Cape).

(2) Deer Passage Section: all waters of the King Cove District between 162°15' W.long. (longitude of Bold Cape) and 162°25' W.long (longitude of Vodapoini Point), and north of 54°55' N.lat., excluding all waters of Lenard Harbor.

(3) Cold Bay Section: all waters of the King Cove District bounded by a line from Thin Point to Vodapoini Point.

(4) General section: all other waters of the King Cove District.

(d) Unimak District: all waters on the southside of Unimak Island between 163°30' W.long. and the longitude of Scotch Cap Light.

(e) Akutan District: all waters extending west of Unimak Island to and including Akutan Pass.

-Continued-

(f) Unalaska District: all waters west of Akutan Pass to and including Umnak Pass.

(1) Unalaska Bay Section: all waters of the Unalaska Bay District enclosed by a line from Priest Rock at 54°00'24" N.lat., 166°22'42" W.long. to Cape Cheerful at 54°00'33" N.lat., 166°37'45" W.long.

(2) General Section: all waters of the Unalaska District not included in the Unalaska Bay Section.

(g) Umnak District: all waters west of Umnak Pass to and including Atka Pass.

(h) Adak District: all waters west of Atka Pass to the terminus of the Aleutian Islands.

(i) Amak District: all Bering Sea waters south and west of Cape Lieskof (55°47' N.lat., 162°04' W.long.) to the longitude of Cape Sarichef Light, including all waters of Bechevin Bay and Isanotski Strait north of a line from the False Pass Cannery dock to the tip of Nichols Point.

(j) Port Moller District: all Bering Sea waters between the latitude of Cape Lieskof and the latitude of Cape Seniavin (56°24' N.lat.).

(1) Western Section: all waters of the Port Moller District west of the longitude of Wolf Point on Walrus Island, excluding the waters of Herendeen Bay and Deer Island - Mud Bay Sections.

(2) Deer Island - Mud Bay Section: all waters of the Port Moller District bounded by a line from the northernmost tip of Point Edward to the southernmost tip of Wolf Point on Walrus Island to Point Divide (55°53'10" N.lat., 160°47' W.long.) to the northernmost tip of Black Point.

(3) Herendeen Bay Section: all waters of Herendeen Bay south of a line from the northernmost tip of Black Point to Point Divide (55°53'10" N.lat., 160°47' W.long.).

(4) Inner Port Moller Section: all waters of Port Moller Bay enclosed by a line from Point Divide (55°53'10" N.lat., 160°47' W.long), to Harbor Point (55°55' N.lat.,160°34'30" W.long.).

(5) Outer Port Moller Bay Section: all waters of the Port Moller District south and east of a line from Point Divide (55°53'10" N.lat., 160°47' W.long.) to the southernmost tip of Wolf Point on Walrus Island to the southernmost tip of Entrance Point (55°59'30" N.lat., 160°34' W.long.).

(6) Bear River Section: all Bering Sea waters between the longitude of Wolf Point on Walrus Island and Cape Seniavin Light, excluding the waters of the Herendeen Bay, Deer Island - Mud Bay, Outer Port Moller Bay, and Inner Port Moller Bay Sections.

(k) Port Heiden District: all waters between the latitude of Cape Seniavin (56°24' N.lat.) and the latitude of Cape Menshikof (57°31'20" N.lat.).

5 AAC 27.610. FISHING SEASONS AND PERIODS.

(a) In the Sand Point, Pavlof, King Cove, Amak, Port Moller, and Port Heiden Districts, herring may be taken from April 15 through July 15 (sac roe season).

(d) Herring may be taken only during periods established by emergency order.

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(e) In the Unimak, Akutan, Unalaska, Umnak, and Adak Districts, herring may be taken from April 15 through July 15 (sac roe season) and from 12:00 noon July 15 through February 28 (food and bait season).

5 AAC 27.630. GEAR. Herring may be taken only by purse seines and gillnets.

5 AAC 27.631. GILLNET SPECIFICATIONS AND OPERATIONS.

(a) During the herring sac roe season, the aggregate length of herring gillnets in use by a herring CFEC permit holder may not exceed 150 fathoms.

(b) The interim-use or entry permit holder must be physically present while the gillnet is being fished.

(c) Each drift gillnet in operation must have a buoy at one end and the opposite end must be attached to the fishing vessel. Each set gillnet in operation must be anchored and buoyed at both ends. Each buoy must be plainly and legibly marked with the permanent vessel license plate number (ADF&G number) of the vessel operating the gear. The buoy may bear only a single number and this number must be that of the vessel used in operating the gear. The numbers must be painted on the top one-third of the buoy in numerals at least four inches in height, one-half inch in width and in a color contrasting to that of the buoy. The buoy markings must be visible on the buoy above the water surface.

5 AAC 27.632. SEINE SPECIFICATIONS AND OPERATIONS. During the sac roe herring season, no purse seine may be more than 1,000 meshes in depth and more than 100 fathoms in length. During the food and bait herring season, no purse seine may be more than 250 fathoms in length.

5 AAC 27.650. WATERS CLOSED TO HERRING FISHING.

(a) Herring may not be taken from June 25 through September 30 in any waters closed to salmon fishing.

5 AAC 27.662. BUYER AND TENDER REPORTING REQUIREMENTS. In addition to the requirements of 5 AAC 39.130(f) each tender operator and each buyer or his agents shall report in person to and register with a local representative of the department upon arrival in the statistical area before commencing operations and before changing location of the operation. Each buyer shall:

(1) identify all vessels to be employed in transporting or processing herring and shall register such vessels with a local representative of the department located in the statistical area before transporting or processing of herring;

(2) make daily reports of all herring purchased from fishermen, and other processing records as specified by a local representative of the department; and

(3) submit fish tickets before departure from the area and no later than 10 days after termination of buying operations in the area, or as otherwise specified by a local representative of the department.

APPENDIX C: Aleutian Islands "Dutch Harbor" food and bait herring forcast, 1999.

This forcast is for the "Dutch Harbor": Unimak, Akutan, and Unalaska Districts and that portion of the Umnak District located east of Samalga Pass, food and bait herring fishery (Kathy Rowell, ADF&G, Anchorage, memo Feburary, 17,1999).

A 1,155 ton quota was allocated for the "Dutch Harbor" food and bait herring fishery for 1999 using the Bering Sea Herring Management Plan allocation formula, as follows, given the maximum 20% exploitation rate of the projected biomass:

Harvest Allocation of the 1999 Forecasted Pacific Herring Run Biomass, Togiak District, Bristol Bay

	Biomass (Short Tons)	Harvest (Short Tons)
1999 Forecasted Biomass	90,000	
Exploitation @ maximum 20% for Total Allowable Harvest		18,000
Togiak Spawn-on-Kelp Fishery (Fixed Allocation)		1,500
Remaining Allowable Harvest		16,500
Dutch Harbor Food/Bait Allocation (7.0% of the remaining allocation)		**1,155**
Remaining Allowable Harvest for Togiak District Sac Roe Fishery:		15,345
Purse Seine Allocation 75.0%		11,509
Gill Net Allocation 25.0%		3,836

Appendix D. Alaska Peninsula sac roe herring forecast, 1999.

This forecast is for North and South Alaska Peninsula areas with guideline harvest levels, excluding those areas open for exploration such as the General Section of the Sand Point District, Seal Cape-Wosnesenski Section, the General Section of the King Cove District, Amak District, and the Western Section of the Port Moller District. This forecast does not include the Aleutian Islands Management Area, which has no history of sac roe herring harvests, nor the Port Heiden District which had a commercial harvest only during 1992.

The 1999 North Peninsula forecasted harvest between 0 and 150 tons which is expected to be taken in the Port Moller District. This forecast is based on the 1998 biomass estimate and applying a sliding scale exploitation rate to the estimate. A reduced level of aerial surveys in 1998 reduced confidence in 1998 stock size. However, adjustments to the guideline harvest level will be made inseason once herring biomass is quantified. The following table shows the sliding scale allowable harvest on the estimated mature biomass when it is assumed the threshold of 1,000 tons will be reached.

Stock Size (Short Tons)	Sliding Scale Exploitation Rate	Allowable Harvest
Less than 1,000	0%	0
1,001-1,500	10%	100-150
1,501-1,999	10%	150-200
2,000-2,500	15%	300-375
2,501-3,000	15%	375-450
> 3,000	20%	> 450

At low biomass levels a conservative approach will be taken to allow the local stocks to rebuild and to account for North Peninsula herring that may contribute to the Dutch Harbor food and bait fishery. Rowell et. al. (1990) estimated that up to 22% of the Dutch Harbor food and bait harvest may be non-Togiak herring. Based on estimated travel time of eastern Bering Sea herring stocks to Dutch Harbor and the fishery opening date of July 16, North Peninsula stocks may comprise a portion of the non-Togiak component. During periods when large biomass levels are observed a higher harvest rate will be allowed. Based on Alaska Board of Fisheries findings, exploitation rate may not exceed 20% of the mature biomass of those stocks. The forecast does not include the Port Heiden District where commercial fishing occurred only during 1992. Samples during the 1998 season indicate a dominance of age 5 herring and age 6 herring are expected to dominate the 1999 harvest.

Confidence in the North Peninsula forecast is only fair. In the Port Moller District, a 1,000 ton threshold of mature herring is required before the department may allow a commercial harvest in that district. In prior years it was assumed that the threshold requirements were achieved before aerial surveys were conducted. However, in 1996 biomass surveys were conducted earlier than normal with no herring observed during the initial surveys.

The 1999 South Peninsula forecasted sac roe harvest is 40 tons. The forecast is based on the average 1994-98 average sac roe harvest of 39.1 tons. No age class data was available in 1998, so it is unknown what age classes will dominate the 1999 harvest.

Confidence in the South Peninsula forecast is only fair.

Appendix E. Estimated age composition of North Peninsula commercial purse seine sac roe herring harvests by area and percent, 1985-98.

		Percent at age (Years)									
Area	Year	2	3	4	5	6	7	8	9	10	11+
Herendeen Bay Section											
	1985	0	5	49	21	15	6	4	0	0	0
	1986	0	0	3	25	13	20	21	17	1	0
	1987	0	2	4	22	24	17	13	10	6	2
	1988	0	3	23	30	22	9	4	3	3	2
	1989	0	0	2	62	22	5	1	1	0	7
	1990	0	14	3	1	57	15	3	1	1	5
	1991	0	2	72	5	2	11	4	0	2	3
	1992	No harvest in this section									
	1993	No samples from this section									
	1994	No harvest in this section									
	1995	0	5	22	42	17	7	2	0	0	5
	1996	1	60	20	7	7	4	1	0	0	0
	1997	No harvest in this section									
	1998	No harvest in this section									
Deer Island-Mud Bay Sections											
	1991	0	1	65	7	3	18	5	0	1	1
	1992	0	0	17	64	5	2	6	3	2	2
	1993-98	No samples from this section									
Inner Port Moller Bay Section											
	1985	0	1	12	8	15	33	27	2	0	1
	1986	0	1	7	21	12	18	19	20	1	1
	1987	0	2	11	13	22	12	11	17	11	0
	1988	0	1	30	29	12	6	5	5	8	5
	1989	0	1	1	67	19	3	1	2	2	4
	1990	0	13	4	2	49	16	5	2	2	6
	1991	0	1	59	13	2	16	1	5	2	1
	1992	0	0	23	60	4	2	6	2	1	2
	1993	0	0	0	10	48	5	2	17	8	10
	1994	0	0	3	12	19	46	4	1	10	6
	1995	0	1	2	8	16	23	38	3	4	6
	1996	No harvest in this section									
	1997	No harvest in this section									
	1998	0	0	6	65	5	12	6	3	3	0
Outer Port Moller Bay											
	1985	0	1	26	16	20	17	17	1	1	0
	1986	0	0	2	22	13	21	23	18	1	0
	1987	0	2	48	9	14	5	11	8	3	0

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Appendix E. (page 2 of 2)

Area	Year	Percent at age (Years) 2	3	4	5	6	7	8	9	10	11+
	1988				No harvest in this section						
	1989	0	0	0	6	26	6	24	7	10	21
	1990 [a]	90	10	0	0	0	0	0	0	0	0
	1991	0	3	74	6	1	11	2	1	1	0
	1992	0	2	41	49	2	0	2	2	0	2
	1993				No samples from this section						
	1994	0	0	8	8	0	54	0	0	23	8
	1995				No samples from this section						
	1996[a]	0	50	28	14	5	0	3	0	0	0
	1997				No harvest in this section						
	1998	1	1	4	41	13	18	10	4	4	3
Bering Sea Coast											
Bear River area											
	1991	0	2	86	8	0	4	1	0	0	1
	1992				No harvest in this section						
	1993				No samples from this section						
	1994-97				No harvest in this section						
	1998	0	0	0	68	5	16	3	3	5	0
Cape Kutuzof area											
	1991	0	0	37	10	0	40	9	2	2	2
	1992-98				No harvest in this section						
Port Heiden Bay Section											
	1992	0	0	9	64	5	1	13	2	1	4
	1993-98				No harvest in this section						

[a] Juvenile herring sample.

Appendix F. Estimated age composition of South Peninsula commercial purse seine sac roe herring harvests by area and percent, 1985-98.

Year	Ages 2	3	4	5	6	7	8	9	10	11
Stepovak Bay										
1985	No samples									
1986-87					No Harvest in this section					
1988	0	5	78	17	0	0	1	0	0	0
1989	0	3	31	50	13	0	0	0	2	0
1990	1	6	8	28	50	7	1	0	1	1
1991[a]	0	4	13	6	23	42	13	0	0	0
1992					No Harvest in this section					
1993[a]	No samples									
1994-95					No Harvest in this section					
1996	No samples									
1997					No Harvest in this section					
1998					No Harvest in this section					
Balboa										
1988	0	32	50	9	0	1	3	1	2	3
1989	No samples									
1990	0	4	7	22	59	4	0	4	0	0
1991	0	16	11	16	26	32	0	0	0	0
1992-94					No Harvest in this section					
1995	No samples									
1996	No samples									
1997					No Harvest in this section					
1998					No Harvest in this section					
Shumagin Islands										
1989	0	1	15	79	1	0	0	3	0	2
1990	0	4	0	26	67	2	0	0	0	1
1991	0	0	17	2	30	48	2	0	0	0
1992-95				No Harvest in this section						
1996	0	0	16	73	8	3	0	0	0	0
1997				No Harvest in this section						
1998				No Harvest in this section						
Canoe Bay										
1985	0	1	3	81	7	6	1	1	0	1

- Continued -

Year	Percent at age (Years)									
	2	3	4	5	6	7	8	9	10	11
1986	0	6	0	3	82	6	2	0	1	0
1987	0	25	28	1	5	34	3	3	0	0
1988	0	24	31	20	0	1	16	4	2	1
1989	0	6	56	22	9	0	0	5	1	1
1990	0	23	5	49	17	5	0	0	1	0
1991	0	27	16	1	41	12	2	0	1	0
1992	0	0	6	9	1	55	23	4	0	2
1993	0	21	4	16	9	2	35	11	2	1
1994	0	71	15	1	9	2	1	2	0	0
1995	No samples									
1996[b]	0	0	0	29	26	5	12	5	3	20
1997	No Harvest in this section									
1998	No Harvest in this section									
Pavlof Bay										
1985-86	No samples									
1987	0	6	18	5	11	48	9	2	1	0
1988	0	34	50	5	0	2	7	0	2	0
1989	No samples									
1990-95										
1996[b]	0	0	0	29	26	5	12	5	3	20
1997	No Harvest in this section									
1998	No Harvest in this section									
Lenard Harbor										
1986	0	3	0	3	83	7	4	0	0	0
1987	0	67	5	0	3	25	0	0	0	0
1988-89	No samples									
1990	0	3	2	35	46	6	0	3	6	0
1991-98	No Harvest in this section									

[a] The 1991 and 1993 Stepovak Bay catch was in the northeastern portion of the bay.

[b] The samples from Canoe Bay and Pavlof Bay were mixed.